JAGDAG Hazardous Substances/ Non-Hazardous Pollutants Consultation June 2018

Contents

SUMMARY: NON-HAZARDOUS	Yes / No / Insuffcent data / Borderline / assume yes or no?	Value	Reference	Comments
			2-aminoethanol (CAS: 141-43-5)	
Is substance persistent, bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test	Yes	90% degradation over 21 days	SIDS, ECHA-CHEM	An OECD 301 study reported 90% degradation over 21days. A number of other studies were also reported which indicated ready biodegradability including a study which reported >70% degradation over 28days
Passes inherent biodegradation test				
If answer to either question is YES, substance is not persistent				
If answer to both questions is NO, additional data on half life is required				
Half life marine water ≥ 60 days Half life fresh or estuarine water ≥ 40 days Half life marine sediment ≥ 180 days Half life fresh or estuarine sediment ≥ 120 days Half life in soil ≥ 120 days	See comment			No specific degradation half life data was located however as noted above a number of studies were reported which indicated ready biodegradability
If answer to any question is YES, substance is persistent				
If answer to all questions is NO, substance is not persistent				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**No**			**The data available indicates that this substance is readily biodegradable and therefore does not meet the criteria for persistence.**
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No	3.16	SIDS (2013)	A BCF of 3.16 was estimated from the log Kow (noted below). An estimated BCF of 2.3 was reported in ECHA-CHEM. The available data therefore does not indicate it meets the criteria for bioaccumulation
Does field data show evidence for biomagnification?	No data			
If answer to either question is YES, substance is bioaccumulative				
If no BCF data, is log Kow ≥ 4.5?	No	-2.3	SIDS (2013)	A measured log Kow of -2.3 was reported which indicates that it does not meet the criteria
If answer is YES, substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely? Substance is chronically non-toxic in mammals Molecular size ≥ 4.3nm Molecular weight ≥ 1100g/mol Octanol solubility ≤ 0.002mmol/l	Not considered due to the above data			
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative *If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained*				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**			**The available data indicates it does not meet the criteria for bioaccumulation**
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No	0.85mg/l	SIDS, ECHA-CHEM	A chronic 21d NOEC of 0.85mg/l was reported for the invertebrate Daphnia magna. This indicates that it does not meet the criteria for chronic toxicity. Chronic data was available for two fish species which reported chronic NOECs of 1.77mg/l and 1.24mg/l. A NOEC of 1mg/l was reported for the alga Pseudokirchneriella subcapitata. These data indicate it does not meet the criteria for chronic toxicity
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		ECHA C&L database	An EU harmonised classification is available for 2-aminoethanol. It indicates that it does not meet these criteria
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		ECHA C&L database	An EU harmonised classification is available for 2-aminoethanol. It indicates that it does not meet these criteria
If answer to any question is YES, substance is toxic *If answer to all questions is NO, substance is not toxic*				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No**			**The available data indicates it does not meet the criteria for toxicity**
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	No (see comment)			No specific degradation half life data was located however as noted above a number of studies were reported which indicated ready biodegradability
Half life in marine, fresh or estuarine sediment ≥ 180 days Half life in soil ≥ 180 days				
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No	3.16	SIDS (2013)	A BCF of 3.16 was estimated. A further BCF of 2.3 was reported in ECHA-CHEM. The available data does not indicate it meets the criteria for bioaccumulation
If answer is yes, substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?				
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		ECHA C&L database	An EU harmonised classification is available for 2-aminoethanol which indicates that it does not meet these criteria
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	No			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			

equivalent risk phrases: T;R23/24/25, T+;R26/27/28 *(does not include Xn; R20, Xn;R21, Xn;R22)*
* equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 *(does not include R33, R67, Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61 *(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)*

Does substance have breakdown products of concern? No

REFERENCES

ECHA C&L database http://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/60615
SIDS (2013) 2 -aminoethanol http://webnet.oecd.org/Hpv/UI/handler.axd?id=27d71248-4be0-45ad-81bc-069b0fe7839c
ECHA-CHEM http://echa.europa.eu/registration-dossier/-/registered-dossier/15808/6/2/6/?documentUUID=402c910b-290a-4d96-968c-67701248a434

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SUMMARY: NON-HAZARDOUS	2-butoxyethanol (CAS: 111-76-2) (Ethylene glycol butyl ether)			
	Yes / No / Insufficent data / Borderline / assume yes or no?	Value	Reference	Comments
Is substance persistent, bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test	Yes		SIDS (1997) / EU (2006)	Studies reported in the SIDS review indicate 77% degradation after 3 days and 100% after 7days. The OECD 28d closed bottle test was noted to give 75% and 88% degradation. These indicate ready biodegradation. The EU risk assessment (2006) noted a number of ready biodegradability studies reported degradation >60% which resulted in it being reported as readily biodegradable
Passes inherent biodegradation test				
If answer to either question is YES, substance is not persistent *If answer to both questions is NO, additional data on half life is required*				
Half life marine water ≥ 60 days Half life fresh or estuarine water ≥ 40 days Half life marine sediment ≥ 180 days Half life fresh or estuarine sediment ≥ 120 days Half life in soil ≥ 120 days	No	7 -28days	SIDS (1997)	Half lives in surface water noted as 7 days to 4 weeks. .
If answer to any question is YES, substance is persistent *If answer to all questions is NO, substance is not persistent*				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**No**			
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No	2.51	SIDS (1997)	No measured BCF values were located however a value of 2.51 was reported based on an estimation from the Log Kow value. This low BCF is supported by an estimated BCF of 0.97 for fish reported in the EU risk assessment. This was estimated based on a log Kow of 0.8.
Does field data show evidence for biomagnification? *If answer to either question is YES, substance is bioaccumulative*				
If no BCF data, is log Kow ≥ 4.5?	No	0.81	SIDS (1997)	The log Kow value does not indicate it meets the criteria for bioaccumulation. This is supported by data in the EU risk assessment (2006) which notes estimated log Kow values have been reported in the range of 0.57 - 0.8 and measured values in the range 0.74 - 0.83.
If answer is YES, substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely? Substance is chronically non-toxic in mammals Molecular size ≥ 4.3nm Molecular weight ≥ 1100g/mol Octanol solubility ≤ 0.002mmol/l	Not assessed due to the above information			
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative *If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained*				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**			
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No	100mg/l	EU risk assessment (2006)	The lowest chronic NOEC was a 21d NOEC for the invertebrate Daphnia magna of 100mg/l. This was supported by a chronic study for the invertebrate Ceriodaphnia dubia which reported a 7d EC10 of 134.9mg/l. Chronic data for the zebra fish gave a 21d NOEC of >100mg/l and for the alga Pseudokirchneriella subcapitata a 3d NOEC of 286mg/l.
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		ECHA C&L database	An EU harmonised C&L classification is available for 2-butoxyethanol. The classification indicated it did not meet these criterion
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		ECHA C&L database	An EU harmonised C&L classification is available for 2-butoxyethanol. The classification indicated it did not meet these criterion
If answer to any question is YES, substance is toxic *If answer to all questions is NO, substance is not toxic*				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No**			
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			**Does not meet the criteria for persistence, bioaccumulation or toxicity**
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	No (see comment)			Half lives in surface water noted as 7 days to 4 weeks (SIDS). A number of studies were reported which indicated it met the criteria for ready biodegradability (EU 2006).
Half life in marine, fresh or estuarine sediment ≥ 180 days Half life in soil ≥ 180 days				
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No	2.51	SIDS	No measured BCF values were located however a value of 2..51 was reported based on an estimation from the Log Kow value
If answer is yes, substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			**Does not meet the criteria for either vP or vB**
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?				
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		ECHA C&L database	An EU harmonised C&L classification is available for 2-butoxyethanol. The classification indicated it did not meet these criterion
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	No			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			

equivalent risk phrases: T:R23/24/25. T+:R26/27/28 *(does not include Xn: R20. Xn:R21. Xn:R22)*
* equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 *(does not include R33, R67, Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61 *(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)*

Does substance have breakdown products of concern? No

REFERENCES

ECHA C&L database https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/129381
ECHA CHEM https://echa.europa.eu/registration-dossier/-/registered-dossier/15247
SIDS (1997) 2-butoxyethanol http://webnet.oecd.org/Hpv/Ui/handler.axd?id=0fbae729-1207-4829-b0e8-f1f1b1f7a8d4
EU Risk Assessment report - 2-butoxyethanol (2006) https://echa.europa.eu/documents/10162/e74a38e1-b9e1-4568-92c5-615c4b56f92d

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2-methoxymethylethoxypropanol (CAS: 34590-94-8) (Dipropylene glycol methyl ether)

SUMMARY: NON-HAZARDOUS	Yes / No / Insufficent data / Borderline / assume yes or no?	Value	Reference	Comments
Is substance persistent, bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test	Yes	93% after 13 days	SIDS (2001)	Ready biodegradation was noted to be observed based on 93% degradation after 13 days and 79% after 28 days. Both were in aerobic environments. It was noted that degradation may be slower in anaerobic environments
Passes inherent biodegradation test				
If answer to either question is YES, substance is not persistent				
If answer to both questions is NO, additional data on half life is required				
Half life marine water ≥ 60 days	No data (see comment)			No degradation half life data were located, however as noted above data was available which indicated ready biodegradability
Half life fresh or estuarine water ≥ 40 days				
Half life marine sediment ≥ 180 days				
Half life fresh or estuarine sediment ≥ 120 days				
Half life in soil ≥ 120 days				
If answer to any question is YES, substance is persistent				
If answer to all questions is NO, substance is not persistent				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**No**			**The available data indicate it is readily biodegradable and does not meet the criteria for persistence**
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No	1	SIDS (2001)	It was reported in the SIDS document that based on the log Kow data an estimated BCF value would be 1 or less
Does field data show evidence for biomagnification?				
If answer to either question is YES, substance is bioaccumulative				
If no BCF data, is log Kow ≥ 4.5?	No	0.0061	SIDS (2001)	This log Kow value reported in SIDS is supported by log Kow values noted in ECHA-CHEM which range from 0.004 - 0.35
If answer is YES. substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely?	Not assessed due to above data			
Substance is chronically non-toxic in mammals				
Molecular size ≥ 4.3nm				
Molecular weight ≥ 1100g/mol				
Octanol solubility ≤ 0.002mmol/l				
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative				
If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**			
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No	0.5mg/l	SIDS (2001)	Limited chronic data was available. A chronic study for the invertebrate Daphnia magna noted a 22d NOEC (reproduction) of 0.5mg/l. This is supported by acute toxicity data for fish, invertebrates and algae which indicate low acute toxicity to the species studied. Acute data indicated low acute toxicity with a 4d LC50 of >10000mg/l reported for the fathead minnow, and a 2d LC50 of 1919mg/l reported for Daphnia magna. For algae a 3-4day EC10 of 133mg/l was reported for Selenastrum capricornutum. This data indicates it does not meet the criteria for aquatic toxicity.
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		ECHA C&L database	EU harmonised C&L classification not available. Industry submissions on the C&L database indicate it does not meet these criteria. Data included in the SIDS (2001) review also indicate it does not meet these criteria as low repeat dose toxicity was noted
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		ECHA C&L database	EU harmonised C&L classification not available. Industry submissions on the C&L database indicate it does not meet these criteria. SIDS(2001) noted that it was not considered to be carcinogenic, a reproductive toxicant or genotoxic based on the available data.
If answer to any question is YES, substance is toxic				
If answer to all questions is NO, substance is not toxic				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No**			
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	No		SIDS (2001)	Studies have been reported which indicate ready biodegradability (see above)
Half life in marine, fresh or estuarine sediment ≥ 180 days				
Half life in soil ≥ 180 days				
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No	1	SIDS (2001)	Estimated BCF of 1 has been reported based on the log Kow values
If answer is yes, substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?	Not assessed			
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		ECHA C&L database/SIDS (2001)	EU harmonised C&L classification not available. Industry submissions on the C&L database indicate it does not meet these criteria. The SIDS report note no genotoxicity data is available but that data for a similar substance indicates it would not be mutagenic.
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	**No**			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			

equivalent risk phrases: T;R23/24/25, T+;R26/27/28 *(does not include Xn; R20, Xn;R21, Xn;R22)*
* equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 *(does not include R33, R67, Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61 *(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)*

Does substance have breakdown products of concern? No

REFERENCES

ECHA C&L database http://echa.europa.eu/information-on-chemicals/cl-inventory-database
SIDS (2001) Dipropylene glycol methyl ether http://webnet.oecd.org/Hpv/UI/handler.axd?id=82aa491f-c9e0-4b2f-81cf-e7ca3bceea1c
ECHA-CHEM http://apps.echa.europa.eu/registered/data/dossiers/DISS-9ea9583b-ed61-603b-e044-00144f67d031/DISS-9ea9583b-ed61-603b-e044-00144f67d031_DISS-9ea9583b-ed61-603b-e044-00144f67d031.html

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SUMMARY: NON-HAZARDOUS	Yes / No / Insufficent data / Borderline / assume yes or no?	Value	Reference	Comments
			2-methyl-2H-isothiazol-3-one (CAS: 2682-20-4)	
Is substance persistent, bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test	No		ECHA CLP RAC report/EU BPD assessment	The available data indicates it is not readily biodegradable
Passes inherent biodegradation test				
If answer to either question is YES, substance is not persistent				
If answer to both questions is NO, additional data on half life is required				
Half life marine water ≥ 60 days	No	29.7days	ECHA C&L RAC report	A degradation half life of 29.7days was reported in seawater.
Half life fresh or estuarine water ≥ 40 days	No	0.87 - 4.17days	EU BPD assessment/ECHA CLP RAC report	Data indicates biodegradation is a key degradation route with half lives reported in the order of 0.87 to 4.17days
Half life marine sediment ≥ 180 days				
Half life fresh or estuarine sediment ≥ 120 days				
Half life in soil ≥ 120 days	No	0.15 - 0.51days	EU BPD assessment/ECHA CLP RAC report	Data indicates biodegradation is a key degradation route with half lives reported in the order of 0.15 - 0.51days in soil
If answer to any question is YES, substance is persistent				
If answer to all questions is NO, substance is not persistent				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**No**			**The avaialble degradation data indicates that this substance does not meet the criteria for Persistence**
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No	0.107l/kg	EU Biocide risk assessment	Estimated BCF value for fish.
Does field data show evidence for biomagnification?				
If answer to either question is YES, substance is bioaccumulative				
If no BCF data, is log Kow ≥ 4.5?	No	-0.34	EU Biocide Risk assessment/ECHA CLP RAC report	This experimental log Kow is -0.34 at pH 7 and 10oC.
If answer is YES, substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely? Substance is chronically non-toxic in mammals Molecular size ≥ 4.3nm Molecular weight ≥ 1100g/mol Octanol solubility ≤ 0.002mmol/l	Not assessed due to the above information			
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative *If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained*				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**			
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No	0.024mg/l	EU Biocide assessment/ECHA CLP RAC report	The value of 0.024mg/l was the lowest chronic data point located from the available data sources. It is an EC10 value for a 24hr study on the alga Pseudokirchneriella subcapitata. This is supported by other data for algae as well as a chronic study on the invertebrate Daphnia magna which gave a 21d NOEC of 0.0442mg/l. Chronic data for fish was available but indicates lower chronic toxicity with NOECs reported in the range of 2.1 - 2.38mg/l.
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		ECHA C&L database/ECHA C&L RAC report (2016)	The ECHA C&L database does not include a harmonised classification for this substance. The majority of the industry data submissions indicate it does not meet these criteria although some indicate STOT RE2. The RAC (Committee for Risk Assessment) document however notes that it does not meet the criteria for STOT RE1 or RE2.
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		ECHA C&L database/ECHA C&L RAC report (2016)	The ECHA C&L database does not include a harmonised classification for this substance. The industry data submissions indicate it does not meet these criteria. The RAC (Committee for Risk Assessment) document however notes that it does not meet these criteria
If answer to any question is YES, substance is toxic *If answer to all questions is NO, substance is not toxic*				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No**			
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	No	See data and comments above		
Half life in marine, fresh or estuarine sediment ≥ 180 days				
Half life in soil ≥ 180 days				
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No	See data and comments above		
If answer is yes, substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?	Not assessed			
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		ECHA C&L database/ECHA C&L RAC report (2016)	The ECHA C&L database does not include a harmonised classification for this substance. The industry data submissions indicate it does not meet these criteria. The RAC (Committee for Risk Assessment) document however notes that it does not meet these criteria
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	**No**			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			
Does substance have known breakdown products of concern? *(Determinations on known key breakdown products will be undertaken if known. It is acknowledged in the methodology that it is not possible to assess every breakdown product)*	No			

equivalent risk phrases: T;R23/24/25, T+;R26/27/28 *(does not include Xn; R20, Xn;R21, Xn;R22)*
* equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 *(does not include R33, R67, Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61 *(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)*

REFERENCES

ECHA RAC report (2016) https://echa.europa.eu/documents/10162/b32e77aa-b720-4f66-ad16-a413dadf1631
EU BPD assessment (2014) http://dissemination.echa.europa.eu/Biocides/ActiveSubstances/1229-13/1229-13_Assessment_Report.pdf
ECHA C&L database https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discl/details/121117

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SUMMARY: NON-HAZARDOUS	Yes / No / Insuffcent data / Borderline / assume yes or no?	Value	Reference	Comments
				1,3,5-trimethylhexahydro-1,3,5-triazine (CAS: 108-74-7)
Is substance persistent, bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test	Yes	64% at 28days	ECHA CHEM/GESAMP	Limited data is available for this substance. The results of an OECD 306 study were reported. This indicated 64% degradation at 28days which indicates ready biodegradability. GESAMP have classified this substance as readily biodegradable
Passes inherent biodegradation test				
If answer to either question is YES, substance is not persistent				
If answer to both questions is NO, additional data on half life is required				
Half life marine water ≥ 60 days Half life fresh or estuarine water ≥ 40 days Half life marine sediment ≥ 180 days Half life fresh or estuarine sediment ≥ 120 days Half life in soil ≥ 120 days	No data (see comment)			No degradation half life data was located.
If answer to any question is YES, substance is persistent				
If answer to all questions is NO, substance is not persistent				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**No**			**Limited data was available on the degradation of this substance. A study indicated it is readily biodegraded and in addition a GESAMP assessment indicated ready biodegradability.**
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000 Does field data show evidence for biomagnification?	No data			No BCF data was located
If answer to either question is YES, substance is bioaccumulative				
If no BCF data, is log Kow ≥ 4.5?	No	0.76	ECHA-CHEM	An experimentally derive log Kow value of 0.76 was noted. This indicates it does not meet the criteria for bioaccumulation. This is supported by data in the GESAMP assessment which indicated that the log Kow was in the range of 2-3.
If answer is YES, substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely? Substance is chronically non-toxic in mammals Molecular size ≥ 4.3nm Molecular weight ≥ 1100g/mol Octanol solubility ≤ 0.002mmol/l	Not assessed due to the above data			
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative *If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained*				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**			**Limited data is available on the potential for bioaccumulation of this substance. No BCF data was located however the available data on log Kow indicates it does not meet the criteria for bioaccumulation**
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No	0.933mg/l	ECHA-CHEM	The only chronic endpoint located was for the algal species Skeletonema costatum. The 3d NOEC was 0.933mg/l which indicates it does not meet the criteria for chronic aquatic toxicity. Acute toxicity data was available for fish, invertebrate and algae. Based on this data the algae appeared to be more sensitive and this links in with the mode of action of this substance. Therefore although only one chronic study located with no data for invertebrates and fish it suggests algae are the most sensitive. The GESAMP assessment indicated no chronic data was available but that acute toxicity data was in the range of 1- 10mg/l.
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	Yes		EU CLP database	A harmonised classification is not available for this substance however industry submissions indication that it meets the criteria for STOT RE2. This was not indicated in the GESAMP assessment however due to the limited data available have based the assessment on the worst case data.
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		EU CLP database	A harmonised classification is not available for this substance however industry submissions indicate that it does not meet these criteria. This is supported by the GESAMP assessment which does not indicate it meets the criteria for C, M, R
If answer to any question is YES, substance is toxic *If answer to all questions is NO, substance is not toxic*				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**Yes**			**Limited data is available for this substance. The data indicates there is the potential for it to be STOT RE2**
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			**Although the available data indicates it meets the criteria for Toxic it does not meet the criteria for either B or P**
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days Half life in marine, fresh or estuarine sediment ≥ 180 days Half life in soil ≥ 180 days	No data (see comment)		ECHA CHEM/GESAMP	Although no half life data available the limited data located indicates it does not meet the criteria for P or vP as it is noted to be readily biodegradable (see above)
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No data (see comment)		ECHA-CHEM	No BCF data was available however the log Kow of 0.76 indicates that it is not expected to meet the criteria for B or vB
If answer is yes, substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			**Limited data was located on the persistence and bioaccumulation of this substance however the available data indicate it is not expected to meet the criteria of vP and vB**
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?	Not assessed			
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		EU CLP database	A harmonised classification is not available for this substance however industry submissions indicate that it does not meet these criteria. This is supported by the GESAMP assessment which does not indicate it meets the criteria for mutagenicity.
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	**No**			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			**Limited data is available on this substance. Based on the information located it indicates that it does not meet the criteria for Hazardous.**
Does substance have known breakdown products of concern? *(Determinations on known key breakdown products will be undertaken if known. It is acknowledged in the methodology that it is not possible to assess every breakdown product)*	No			

equivalent risk phrases: T;R23/24/25. T+;R26/27/28 *(does not include Xn: R20. Xn;R21. Xn;R22)*
* equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 *(does not include R33, R67, Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61
(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)

REFERENCES

ECHA CLP database https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/114911
ECHA-CHEM https://echa.europa.eu/registration-dossier/-/registered-dossier/13293
GESAMP composite list (2017) http://www.imo.org/en/OurWork/Environment/PollutionPrevention/ChemicalPollution/Documents/Website%20composite%20list%202017.pdf
GESAMP Hazard Evaluation Procedure http://www.gesamp.org/site/assets/files/1242/the-revised-gesamp-hazard-evaluation-procedure-for-chemical-substances-carried-by-ships-en.pdf

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SUMMARY: NON-HAZARDOUS	Yes / No / Insuffcent data / Borderline / assume yes or no?	Value	Reference	Comments
			2,2,2-(hexahydro-1,3,5-triazine-1,3,5-triyl)triethanol (CAS: 4719-04-4)	
Is substance persistent, bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test	Yes	90-100%	ECHA-CHEM	Reported studies indicate ready biodegradation. 90-100% removal was reported after 8days in one study and another indicated 89-95% removal in 10days
Passes inherent biodegradation test				
If answer to either question is YES, substance is not persistent *If answer to both questions is NO, additional data on half life is required*				
Half life marine water ≥ 60 days Half life fresh or estuarine water ≥ 40 days Half life marine sediment ≥ 180 days Half life fresh or estuarine sediment ≥ 120 days Half life in soil ≥ 120 days	No data (see comment)			No half life data located however due to the above information half life data was not considered essential
If answer to any question is YES, substance is persistent *If answer to all questions is NO, substance is not persistent*				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**No**			**The available data indicates that it does not meet the criteria for persistence.**
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000 Does field data show evidence for biomagnification?	No data available			BCF values were not located for this substance. However the available log Kow data (see below) indicated it did not meet these criteria
If answer to either question is YES, substance is bioaccumulative				
If no BCF data, is log Kow ≥ 4.5?	No	-2	ECHA-CHEM	A log Kow of -2 was reported and another log Kow was noted to be -1.21. The available data therefore indicate this substance does not meet these criteria
If answer is YES. substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely? Substance is chronically non-toxic in mammals Molecular size ≥ 4.3nm Molecular weight ≥ 1100g/mol Octanol solubility ≤ 0.002mmol/l	Not assessed due to the above information			
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative *If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained*				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**			
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No	1.56mg/l	ECHA-CHEM/ECHA C&L database	A 3d NOEC of 1.56mg/l was reported for the algal species Desmodesmus subspicatus. No other chronic data was located. Acute toxicity data for algae, invertebrates and fish indicated acute effects in the range of 6.6 - 60.7mg/l. This supports the chronic data in indicating it is not expected to meet the criteria for chronic toxicity. In addition the C&L harmonised classification does not indicate a classification for aquatic toxicity.
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		ECHA C&L database	An EU harmonised C&L classification is available which indicates it does not meet the criteria for long term toxicity
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		ECHA C&L database	An EU harmonised C&L classification is available which indicates it does not meet these criteria
If answer to any question is YES. substance is toxic *If answer to all questions is NO, substance is not toxic*				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No**			
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			**The available data do not indicate that this substance meets the criteria for PBT.**
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	No (see comment)		ECHA-CHEM	No half life data located however the available data indicates ready biodegradability and therefore these criteria are unlikely to be met.
Half life in marine, fresh or estuarine sediment ≥ 180 days Half life in soil ≥ 180 days				
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No (see comment)		ECHA-CHEM	BCF values were not located for this substance. However the available log Kow data (-2 and -1.2) indicates it is not likely to bioaccumulate significantly and is therefore not expected to meet these criteria
If answer is yes, substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			**The available data do not indicate that this substance meets the criteria for PBT.**
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?				
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		ECHA C&L database	An EU harmonised C&L classification is available which indicates it does not meet these criteria
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	No			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			**The EU C&L classification does not indicate that this substance meets the criteria for Hazardous. This along with the available weight of evidence therefore indicates this substance would not be determined as Hazardous. Further information on this substance will become available as it is being reviewed under the Biocides Directive for use as a preservative and slimicide.**

 # equivalent risk phrases: T;R23/24/25, T+;R26/27/28 (does not include Xn: R20. Xn;R21. Xn;R22)
** equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 (does not include R33, R67, Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61 (does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)

Does substance have breakdown products of concern? No

REFERENCES

ECHA C&L database http://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/122039
ECHA-CHEM http://echa.europa.eu/brief-profile/-/briefprofile/100.022.916
NICNAS https://www.nicnas.gov.au/chemical-information/imap-assessments/imap-assessment-details?assessment_id=2103

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SUMMARY: NON-HAZARDOUS	Yes / No / Insuffcent data / Borderline / assume yes or no?	Value	Reference	Comments
				2,2,2-nitrotriethanol (CAS: 102-71-6)
Is substance persistent, bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test	Yes		EU CoRAP report (2015)	222-nitrotriethanol was noted to be readily degradable based on the weight of evidence assessed for the purposes of REACH. Two studies noted as supporting data noted 100% degradation after 5days and 86% degradation after 19days.
Passes inherent biodegradation test				
If answer to either question is YES, substance is not persistent *If answer to both questions is NO, additional data on half life is required*				
Half life marine water ≥ 60 days	No	1 to 7.2days	EU CoRAP report (2015)	DT50s for river water in the range of 1 to 7.2days and for a water/sediment system in the range of 1.2 to 1.9days.
Half life fresh or estuarine water ≥ 40 davs Half life marine sediment ≥ 180 days Half life fresh or estuarine sediment ≥ 120 days				
Half life in soil ≥ 120 days	No	>1.4 to <5.4days	EU CoRAP report (2015)	DT50s in the range >1.4 to <5.4days were reported
If answer to any question is YES, substance is persistent *If answer to all questions is NO, substance is not persistent*				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**No**			
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No	<0.4 to <3.9	EU CoRAP report (2015)	BCFs in the range of <0.4 to <3.9 were noted in whole fish in one study. Another study reported a BCF of 0.59 in whole fish.
Does field data show evidence for biomagnification? *If answer to either question is YES, substance is bioaccumulative*				
If no BCF data, is log Kow ≥ 4.5?	No	-2.3	EU CoRAP report	A log Kow of -2.3 was reported for 2,2,2-nitrotriethanol
If answer is YES, substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely? Substance is chronicallv non-toxic in mammals Molecular size ≥ 4.3nm Molecular weight ≥ 1100g/mol Octanol solubility ≤ 0.002mmol/l	Not assessed due to the above information			
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative *If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained*				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**			
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No	16mg/l	EU CoRAP report (2015)	A chronic NOEC value of 16mg/l was reported for a 21day study on Daphnia magna.
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		EU CoRAP report (2015)	An EU harmonised CLP classification is not available for 2,2,2-nitrotriethanol. The majority of industry submissions to the database indicate it does not meet the criteria however a number indicated STOT RE2. The review of the available data for REACH in the CoRAP report concluded that it did not meet the criteria for STOT RE
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		EU CoRAP report (2015)	An EU harmonised CLP classification is not available for 2,2,2-nitrotriethanol. The industry submissions to the database indicate it does not meet the criteria. The review of the available data for REACH in the CoRAP report concluded that it was not carcinogenic, mutagenic or a reproductive toxin.
If answer to any question is YES, substance is toxic *If answer to all questions is NO, substance is not toxic*				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No**			
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			**The EU CoRAP report concludes that it does not meet the criteria for PBT**
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	No	1 to 7.2days	EU CoRAP report (2015)	DT50s for river water in the range of 1 to 7.2days and for a water/sediment system in the range of 1.2 to 1.9days. In addition as noted above the data reviewed in the EU CoRAP report indicate that it is readily biodegradable.
Half life in marine, fresh or estuarine sediment ≥ 180 days Half life in soil ≥ 180 days				
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No	<0.4 to <3.9	EU CoRAP report (2015)	BCFs in the range of <0.4 to <3.9 were noted in whole fish in one study. Another study reported a BCF of 0.59 in whole fish.
If answer is ves. substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			**The EU CoRAP report concludes that it does not meet the criteria for vPvB**
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?	Not assessed			
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		EU CoRAP report (2015)	An EU harmonised CLP classification is not available for 2,2,2-nitrotriethanol. The industry submissions to the database indicate it does not meet the criteria. The review of the available data for REACH in the CoRAP report concluded that it was not mutagenic.
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	No			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			
Does substance have known breakdown products of concern? *(Determinations on known key breakdown products will be undertaken if known. It is acknowledged in the methodology that it is not possible to assess every breakdown product)*	No			

equivalent risk phrases: T;R23/24/25, T+;R26/27/28 *(does not include Xn; R20, Xn;R21, Xn;R22)*
* equivalent risk phrases T:R39/23/24/25. T+:R26/27/28. T;R48/23/24/25 *(does not include R33. R67. Xi: R37. Xn:R4820/21/22. Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61 *(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)*

REFERENCES

ECHA CLP database https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33926
ECHA CoRAP report (2015) https://echa.europa.eu/documents/10162/63d1a4e9-f3e3-45f7-8546-3042f2293dd2

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Acetic Acid (CAS: 64-19-7)

SUMMARY: NON-HAZARDOUS Is substance persistent, bioaccumulative and toxic?	Yes / No / Insufficent data / Borderline / assume yes or no?	Value	Reference	Comments
Persistence				
Passes ready biodegredation test	Yes		EFSA (2013)	It is noted as readily biodegradable in the EFSA report however no detail is provided. However the half life data noted below indicates it does not meet the criteria for persistence.
Passes inherent biodegredation test				
If answer to either question is YES, substance is not persistent				
If answer to both questions is NO, additional data on half life is required				
Half life marine water ≥ 60 days				
Half life fresh or estuarine water ≥ 40 days	No	0.55days	EFSA (2013)	Degradation half life in water was reported as 0.55days. This was supported by data on ECHA-CHEM which indicated 96% biodegradation after 20days in one study and >78% after 14days.
Half life marine sediment ≥ 180 days				
Half life fresh or estuarine sediment ≥ 120 days				
Half life in soil ≥ 120 days	No	0.7 - 1.23 days	EFSA (2013)	Degradation half lives in soil were noted in the range of 0.7 - 1.23days
If answer to any question is YES, substance is persistent				
If answer to all questions is NO, substance is not persistent				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**No**			
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No	3	HSDB	This is reported to be an estimated BCF value based on a log Kow of -0.71. A BCF was not noted in the EFSA report.
Does field data show evidence for biomagnification?				
If answer to either question is YES, substance is bioaccumulative				
If no BCF data, is log Kow ≥ 4.5?	No	0.09	EFSA (2013)	A log Kow of 0.09 was reported in the EFSA report. A log Kow of -0.17 was noted in ECHA-CHEM
If answer is YES, substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely? Substance is chronically non-toxic in mammals Molecular size ≥ 4.3nm Molecular weight ≥ 1100g/mol Octanol solubility ≤ 0.002mmol/l	Not assessed due to the above information			
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative				
If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**			
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No	22.7mg/l	EFSA (2013)	A chronic study on the invertebrate Daphnia magna noted a 21d NOEC (reproduction) of 22.7mg/l. Chronic data was not located for fish or algae in the EFSA study. Acute data for fish included a 4d LC50 of 43.8mg/l for Cyprinus carpio and 45mg/l for Oncorhynchus mykiss. For the algal species Pseudokirchneriella subcapitata a 3d EC50 of 5.8mg/l was reported along with a 14d EC50 of 16mg/l for Lemna minor. A 90day NOEL of 1.26mg/l was reported in Ecotox for the Mozambique tilapia.
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		ECHA C&L database	An EU harmonised C&L classification is available for acetic acid. It indicates does not meet these criteria
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		ECHA C&L database	An EU harmonised C&L classification is available for acetic acid. It indicates does not meet these criteria
If answer to any question is YES, substance is toxic				
If answer to all questions is NO, substance is not toxic				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No**			
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	No	0.55days	EFSA (2013)	Degradation half life in water was reported as 0.55days. This was supported by data on ECHA-CHEM which indicated 96% biodegradation after 20days in one study and >78% after 14days.
Half life in marine, fresh or estuarine sediment ≥ 180 days				
Half life in soil ≥ 180 days				
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No	3	HSDB	Estimated BCF value based on a log Kow of -0.71
If answer is yes, substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?	Not assessed			
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		ECHA C&L database	An EU harmonised C&L classification is available for acetic acid. It indicates does not meet these criteria
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	**No**			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			

equivalent risk phrases: T;R23/24/25, T+;R26/27/28 *(does not include Xn; R20, Xn;R21, Xn;R22)*
* equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 *(does not include R33, R67, Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61 *(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)*

Does substance have breakdown products of concern? No

REFERENCES

ECHA C&L database https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/85625

ECHA-CHEM http://apps.echa.europa.eu/registered/data/dossiers/DISS-9d8c7866-b374-5d28-e044-00144f67d249/AGGR-dfa494cd-9b13-4ef0-bfaf-1af2c053405e_DISS-9d8c7866-b374-5d28-e044-00144f67d249.html

HSDB http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB

Ecotox http://cfpub.epa.gov/ecotox/quick_query.htm

EFSA (2013) Conclusion on the peer review of the pesticide risk assessment of the active substance acetic acid http://onlinelibrary.wiley.com/doi/10.2903/j.efsa.2013.3060/epdf

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SUMMARY: NON-HAZARDOUS	Yes / No / Insuffcent data / Borderline / assume yes or no?	Value	Reference	Comments
				Adipic acid (CAS: 124-04-9)
Is substance persistent, bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test	Yes	68-90% biodegradation after 14days	SIDS (2004)	A number of studies were reported in the SIDS document which indicated adipic acid is readily biodegradable. One study reported 68-90% degradation after 14days, another 91% after 28days and another 83% after 30days
Passes inherent biodegradation test				
If answer to either question is YES, substance is not persistent				
If answer to both questions is NO, additional data on half life is required				
Half life marine water ≥ 60 days	No data (see comment)			No degradation half life data was located however as noted above a number of ready biodegradability studies were reported which indicated it does not meet the criteria for persistence
Half life fresh or estuarine water ≥ 40 days				
Half life marine sediment ≥ 180 days				
Half life fresh or estuarine sediment ≥ 120 days				
Half life in soil ≥ 120 days				
If answer to any question is YES, substance is persistent				
If answer to all questions is NO, substance is not persistent				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**No**			
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No	3	SIDS (2004)	No measured BCFs were located. The SIDS document noted a calculated BCF value of 3 based on a log Kow of 0.093
Does field data show evidence for biomagnification?				
If answer to either question is YES, substance is bioaccumulative				
If no BCF data, is log Kow ≥ 4.5?	No	0.093	SIDS (2004)	
If answer is YES. substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely?	Not assessed due to the above data			
Substance is chronically non-toxic in mammals				
Molecular size ≥ 4.3nm				
Molecular weight ≥ 1100g/mol				
Octanol solubility ≤ 0.002mmol/l				
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative				
If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**			**The BCF and log Kow data indicate that it does not meet the criteria for bioaccumulation**
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No	6.3mg/l	ECHA/CHEM	A 21d NOEC for the invertebrate Daphnia magna was 6.3mg/l. A study on the alga Pseudokirchneriella subcapitata indicated 3d EC10 of 41mg/l. The available chronic data was limited but indicated that adipic acid did not meet the criteria. This was supported by the available acute data which showed acute effects on algae, invertebrates and fish in the range of 27 - >1000mg/l. (SIDS 2004). No chronic aquatic toxicity data was noted in the SIDS review
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		ECHA C&L database	A harmonised CLP classification is available for adipic acid and indicates that it does not meet these criteria
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		ECHA C&L database	A harmonised CLP classification is available for adipic acid and indicates that it does not meet these criteria
If answer to any question is YES, substance is toxic				
If answer to all questions is NO, substance is not toxic				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No**			
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	No (see comment)		SIDS (2004)	Adipic acid has been reported to be readily biodegradable and therefore does not meet the criteria for very persistent
Half life in marine, fresh or estuarine sediment ≥ 180 days				
Half life in soil ≥ 180 days				
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No	3	SIDS (2004)	A calculated BCF of 3 indicates that it does not meet the criteria
If answer is ves. substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?	Not assessed			
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		ECHA C&L database	A harmonised CLP classification is available for adipic acid and indicates that it does not meet these criteria
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	No			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			

equivalent risk phrases: T;R23/24/25, T+;R26/27/28 *(does not include Xn; R20, Xn;R21, Xn;R22)*
* equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 *(does not include R33, R67, Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61 *(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)*

Does substance have breakdown products of concern? No

REFERENCES

SIDS (2004) Adipic acid http://webnet.oecd.org/Hpv/Ui/handler.axd?id=57b53efe-e3c3-46cb-871f-030746856047
ECHA-CHEM http://echa.europa.eu/registration-dossier/-/registered-dossier/15464/6/2/6/?documentUUID=92685140-28f3-4af8-a82e-358c3c92318f
ECHA C&L database http://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/95360

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SUMMARY: NON-HAZARDOUS	Yes / No / Insufficent data / Borderline / assume yes or no?	Value	Reference	Comments
				Alcohols C6-10 ethoxylates (CAS: 70879-83-3)
Is substance persistent, bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test	Yes		HERA Risk assessment (2009)	A number of studies are reported for a range of C chain length alcohol ethoxylates which indicate they are readily biodegraded
Passes inherent biodegradation test				
If answer to either question is YES, substance is not persistent				
If answer to both questions is NO, additional data on half life is required				
Half life marine water ≥ 60 days	No		HERA Risk Assessment (2009)	Degradation half lives in surface water are reported in the order of hours for a range of C chain length alcohol ethoxylates. This along with the information that they are readily biodegradable indicates that this group of substances does not meet the criteria for persistence.
Half life fresh or estuarine water ≥ 40 days				
Half life marine sediment ≥ 180 days				
Half life fresh or estuarine sediment ≥ 120 days				
Half life in soil ≥ 120 days				
If answer to any question is YES. substance is persistent				
If answer to all questions is NO. substance is not persistent				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**No**			
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No	<400	HERA risk assessment (2009)	The available data indicates that BCFs for alcohol ethoxylates are generally below 400 which indicates it does not meet the criteria for bioaccumulation. This is supported in the report by Environment Canada (2013)
Does field data show evidence for biomagnification?				
If answer to either question is YES, substance is bioaccumulative				
If no BCF data, is log Kow ≥ 4.5?	No	3.15 - 4.57	HERA risk assessment (2009)	A range of log Kow values are reported for alcohol ethoxylates with a range of C chain lengths. The log Kow's reported are for those within the 6-10 chain lengths. They indicate that in general the log Kow values reported are below the threshold. The report notes that due to their surfactant properties calculation of log Kow for these substances is more difficult.
If answer is YES, substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely? Substance is chronically non-toxic in mammals Molecular size ≥ 4.3nm Molecular weight ≥ 1100g/mol Octanol solubility ≤ 0.002mmol/l	Not assessed due to the above information			
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative				
If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**			Although some of the log Kow values reported for some of the relevant C chain lengths are close to the threshold of 4.5 the overall weight of evidence including the BCF data indicates that it is not expected to meet the criteria of bioaccumulation
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No	0.7mg/l	HERA (2009)	The NOEC of 0.7mg/l realtes to a chronic study on the fathead minnow. It is supported by chronic studies for a range of fish, invertebrate and algal species which indicate effects in the range of 0.7 - 9.7mg/l. The available data indicates it does not meet the criteria for chronic aquatic toxicity.
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		ECHA C&L database	An EU harmonised classification is not available. Industry data submissions to the C&L database indicate that it does not meet the criteria. This is supported by data in the HERA assessment which reports that the available data does not indicate significant effects from long term exposure
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		ECHA C&L database	An EU harmonised classification is not available. Industry data submissions to the C&L database indicate that it does not meet the criteria. This is supported by data in the HERA assessment which reports that the available data does not indicate mutagenic, carcinogenic or developmental/reproductive effects
If answer to any question is YES, substance is toxic				
If answer to all questions is NO, substance is not toxic				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No**			
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	No		HERA Risk Assessment (2009)	Degradation half lives in surface water are reported in the order of hours for a range of C chain length alcohol ethoxylates. This along with the information that they are readily biodegradable indicates that this group of substances does not meet the criteria for persistence.
Half life in marine, fresh or estuarine sediment ≥ 180 days				
Half life in soil ≥ 180 days				
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No	<400	HERA risk assessment (2009)	The available data indicates that BCFs for alcohol ethoxylates are generally below 400 which indicates it does not meet the criteria for bioaccumulation. This is supported in the report by Environment Canada (2013)
If answer is yes, substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?	Not assessed			
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		ECHA C&L database	An EU harmonised classification is not available. Industry data submissions to the C&L database indicate that it does not meet the criteria. This is supported by data in the HERA assessment which reports that the available data does not indicate mutagenic, carcinogenic or developmental/reproductive effects
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	No			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			

 # equivalent risk phrases: T;R23/24/25, T+;R26/27/28 (does not include Xn; R20, Xn;R21, Xn;R22)
** equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 (does not include R33. R67. Xi: R37, Xn;R4820/21/22. Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61 (does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)

Does substance have breakdown products of concern? No

REFERENCES

ECHA C&L database http://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/110226
HERA - Alcohol ethoxylates (2009) http://www.heraproject.com/files/34-f-09%20hera%20ae%20report%20version%202%20-%203%20sept%2009.pdf
Environment Canada (2013) http://www.ec.gc.ca/ese-ees/164786DB-7B5B-47DF-93FA-888C99E3D612/FEOG_Alcohol_Ethoxylates_EN.pdf

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SUMMARY: NON-HAZARDOUS	Alkyl polyglucoside (CAS: 132778-08-6) C9-11 alkyl D-glycopyranoside, decyl/undecyl glycosides (Nonionic surfactant)			
	Yes / No / Insufficent data / Borderline / assume yes or no?	**Value**	**Reference**	**Comments**
Is substance persistent. bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test	Yes		Gamia et al (1997)	Limited data is available on this substance. Data located indicates it is readily biodegraded. This is supported by the weight of evidence of other non-ionic surfactants and surfactants in general.
Passes inherent biodegradation test				
If answer to either question is YES, substance is not persistent *If answer to both questions is NO, additional data on half life is required*				
Half life marine water ≥ 60 days	No data			No data was located on degradation half lives.
Half life fresh or estuarine water ≥ 40 days Half life marine sediment ≥ 180 days Half life fresh or estuarine sediment ≥ 120 days Half life in soil ≥ 120 days				
If answer to any question is YES, substance is persistent *If answer to all questions is NO, substance is not persistent*				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**No**			Limited data is available on this substance. Data located indicates it is readily biodegraded. This is supported by the weight of evidence of other non-ionic surfactants and surfactants in general.
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No data (see comment)			Interpretation of BCF studies is difficult for surfactants. No specific BCF data was located for alkyl polyglucosides
Does field data show evidence for biomagnification? *If answer to either question is YES. substance is bioaccumulative*				
If no BCF data, is log Kow ≥ 4.5?	No data (see comment)			Experimental derivation of Log Kow is not straight forward for surfactants
If answer is YES, substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely? Substance is chronically non-toxic in mammals Molecular size ≥ 4.3nm Molecular weight ≥ 1100g/mol Octanol solubility ≤ 0.002mmol/l	Not assessed			
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative *If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained*				
Is sufficient data available? (if not assume substance bioaccumulates)	No			
Is substance bioaccumulative?	**Yes (lack of sufficient data)**			No data was located on the bioaccumulation of alkyl polyglucosides. Assessment of bioaccumulation of surfactants is noted to be difficult. In the absence of any data have had to indicate Bioaccumulattive due to lack of data.
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No	1.4mg/l	Gamia et al (1997)	Limited data was available on the toxicity of alkyl polyglucoside. A 21d NOEC of 1.4mg/l was reported for the invertebrate Daphnia magna. Acute toxicity data for Daphnia for alkyl polyglucosides was noted in the range of 37 - 137mg/l.
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		ECHA C&L database	An EU harmonised classification is available however the industry data submissions to the C&L database do not indicate it meets these criteria.
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		ECHA C&L database	An EU harmonised classification is available however the industry data submissions to the C&L database do not indicate it meets these criteria. This is supported by data available on alkylpolyglucosides in general along with other non-ionic surfactants
If answer to any question is YES, substance is toxic *If answer to all questions is NO, substance is not toxic*				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No**			**Limited data was available however the weight of evidence indicates it does not meet the criteria for toxicity**
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	No		Gamia et al (1997)	Limited data is available on this substance. Data located indicates it is readily biodegraded. This is supported by the weight of evidence of other non-ionic surfactants and surfactants in general.
Half life in marine. fresh or estuarine sediment ≥ 180 days Half life in soil ≥ 180 days				
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	Yes (based on lack of data)			Interpretation of BCF studies is difficult for surfactants. No specific BCF data was located for alkyl polyglucosides
If answer is yes, substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			**Limited data was available however the weight of evidence indicates it does not meet the criteria for vPvB**
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?				
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		ECHA C&L database/EAS (2007)	No EU harmonised classification is available however the industry data submissions to the C&L database do not indicate it meets these criteria. This is supported by data available on alkylpolyglucosides in the data submission to the US FDA which noted that the available data for alkyl polyglucosides did not indicate mutagenicity. The data was not specific to the C9-11 alkyl polyglucosides but was noted to be considered applicable to this group.
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	**No**			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			Limited data is available on this substance. The weight of evidence for this substance, other non-ionic surfactants and surfactants in general indicates it does not meet the criteria for Hazardous.

equivalent risk phrases: T;R23/24/25, T+;R26/27/28 *(does not include Xn; R20, Xn;R21, Xn;R22)*
* equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 *(does not include R33, R67, Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61 *(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)*

Does substance have breakdown products of concern? No

REFERENCES

ECHA C&L database http://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/8007
Detergents Ingredients Database (2004) http://www.greencouncil.org/doc/ResourcesCentre/Detergent_Ingredient_Database_2004.pdf
Gamia et al (1997) - Ecological properties of alkyl polyglucosides https://ac.els-cdn.com/S0045653597001197/1-s2.0-S0045653597001197-main.pdf?_tid=e4c1a442-cf7d-11e7-a9c8-00000aacb35f&acdnat=1511352707_5909fab0073273a8cc66306fe799a24a
EAS (2007) GRAS exemption claim - alkyl polyglucoside surfactants https://www.yumpu.com/en/document/fullscreen/5150687/gras-notice-000237-alkyl-polyglycosides-accessdata-fda-food-/24

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SUMMARY: NON-HAZARDOUS	Ammonium chloride (CAS: 12125-02-9)			
	Yes / No / Insufficent data / Borderline / assume yes or no?	Value	Reference	Comments
Is substance persistent, bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test	No data (see comment)			The persistence criteria are not directly applicable to metals/inorganics such as ammonium chloride and were developed principally for organic substances (see comments below)
Passes inherent biodegradation test				
If answer to either question is YES, substance is not persistent				
If answer to both questions is NO, additional data on half life is required				
Half life marine water ≥ 60 days	No		SIDS (2003)	The persistence criteria are not direclty applicable to metals /inorganics such as ammonium chloride and were developed principally for organic substances. No specific information on degradation half lives are available for ammonium chloride. It is very soluble in water however and will dissociate to form ammonium and chloride ions. It will therefore not persist as ammonium chloride. Ammonium ions are likely to be mineralised to nitrite.
Half life fresh or estuarine water ≥ 40 davs				
Half life marine sediment ≥ 180 days				
Half life fresh or estuarine sediment ≥ 120 days				
Half life in soil ≥ 120 days				
If answer to any question is YES, substance is persistent				
If answer to all questions is NO, substance is not persistent				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**No**			**The persistence criteria are not direclty applicable to metals /inorganics such as ammonium chloride and were developed principally for organic substances. Although no degradation half life data is available due to the fact it is very soluble in water and is will dissociate to form ammonium and chloride ions. Ammonium ions will mineralise to nitrite.**
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No (see comment)		SIDS (2003)	BCF studies are not directly relevant to inorganic substances such as ammonium chloride. The SIDS document notes that based on its properties it is not likely to accumulate in aquatic organisms. It also notes that the component ions are common components of living organisms and therefore data on bioaccumulation is not available.
Does field data show evidence for biomagnification?				
If answer to either question is YES, substance is bioaccumulative				
If no BCF data, is log Kow ≥ 4.5?	No (see comment)		SIDS (2003)	Log Kow values are not applicable to inorganics such as ammonium chloride. The SIDS report notes that the log Kow for this substance can't be experimentally derived but that it is expected to be very low.
If answer is YES, substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely?	Not assessed due to above information			
Substance is chronically non-toxic in mammals				
Molecular size ≥ 4.3nm				
Molecular weight ≥ 1100g/mol				
Octanol solubility ≤ 0.002mmol/l				
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative				
If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**			**Although BCF and log Kow data are not directly applicable to ammonium chloride the available the available information indicates that ammonium chloride is not expected to bioaccumulate in aquatic oragnisms**
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No		SIDS (2003)	Chronic toxicity data was reported for algae, invertebrates and fish with effect concentrations reported in the range of 8 - 26.8mg/l.
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		ECHA C&L database	An EU harmonised C&L classification is available for ammonium chloride. This indicates that it does not meet the criteria
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		ECHA C&L database	An EU harmonised C&L classification is available for ammonium chloride. This indicates that it does not meet the criteria
If answer to any question is YES, substance is toxic				
If answer to all questions is NO, substance is not toxic				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No**			
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	No		SIDS (2003)	The persistence criteria are not direclty applicable to metals /inorganics such as ammonium chloride and were developed principally for organic substances. No specific information on degradation half lives are available for ammonium chloride. It is very soluble in water however and will dissociate to form ammonium and chloride ions. It will therefore not persist as ammonium chloride. Ammonium ions are likely to be mineralised to nitrite.
Half life in marine, fresh or estuarine sediment ≥ 180 days				
Half life in soil ≥ 180 days				
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No		SIDS (2003)	BCF studies are not directly relevant to inorganic substances such as ammonium chloride. The SIDS document notes that based on its properties it is not likely to accumulate in aquatic organisms. It also notes that the component ions are common components of living organisms and therefore data on bioaccumulation is not available.
If answer is yes, substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?	Not assessed			
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		ECHA C&L database	An EU harmonised C&L classification is available for ammonium chloride. This indicates that it does not meet the criteria for mutagenicity
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	**No**			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			

 # equivalent risk phrases: T;R23/24/25, T+;R26/27/28 (does not include Xn; R20, Xn;R21, Xn;R22)
** equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 (does not include R33, R67, Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61 (does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)

Does substance have breakdown products of concern? No

REFERENCES

ECHA C&L database https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/34919
OECD SIDS report (2003) http://webnet.oecd.org/Hpv/UI/handler.axd?id=406084d7-4cb1-473b-a419-961968fe91f6

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SUMMARY: NON-HAZARDOUS	Yes / No / Insufficent data / Borderline / assume yes or no?	Value	Reference	Amorphous silica fume (CAS: 69012-64-2) Amorphous silica fume consists of silicon dioxide particles Comments
Is substance persistent. bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test	See comment			Test not applicable for metals/inorganics. The persistence criteria are not directly applicable to metals/inorganics and were developed principally for organic substances. Metals and inorganics such as amorphous silica fume are inherently persistent.
Passes inherent biodegradation test	See comment			
If answer to either question is YES, substance is not persistent				
If answer to both questions is NO, additional data on half life is required				
Half life marine water ≥ 60 days	See comment			Test not applicable for metals/inorganics. The persistence criteria are not directly applicable to metals/inorganics and were developed principally for organic substances. Metals and inorganics such as amorphous silica fume are inherently persistent.
Half life fresh or estuarine water ≥ 40 days Half life marine sediment ≥ 180 days Half life fresh or estuarine sediment ≥ 120 days Half life in soil ≥ 120 days				
If answer to any question is YES, substance is persistent				
If answer to all questions is NO, substance is not persistent				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**Yes (See comment)**			The persistence criteria are not directly applicable to metals/inorganics and were developed principally for organic substances. Metals and inorganics such as amorphous silica fume are inherently persistent.
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No (See comment)		Bernd/Dow Corning/ECHA CHEM	BCF studies are not directly relevant to inorganic substances such as amorphous silica fume. No BCF data is available for amorphous silica fume however it is not expected to accumulate in organisms based on its properties.
Does field data show evidence for biomagnification?				
If answer to either question is YES, substance is bioaccumulative				
If no BCF data, is log Kow ≥ 4.5?	Log Kow values are not applicable to metals/inorganics			Log Kow are not considered reliable estimates of the potential for bioaccumulation of inorganic substances such as amorphous silica.
If answer is YES. substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely? Substance is chronically non-toxic in mammals Molecular size ≥ 4.3nm Molecular weight ≥ 1100d/mol Octanol solubility ≤ 0.002mmol/l	Not assessed due to the above information			
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative *If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained*				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**			
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No	323mg/l	ECHA-CHEM/Bernd	Very little aquatic toxicity data was located. The only chronic endpoint was a 3d NOEC for the alga Skeletonema costatum of 323mg/l. This indicated it did not meet the criteria for chronic toxicity. The available acute toxicity data for algae, invertebrates and fish supported this with effects reported in the range of >100 - 4200mg/l.
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		ECHA C&L database	An EU harmonised classification is not available for amorphous silica fume. The majority of the industry data submissions to the C&L database indicate that it does not meet the criteria. Some noted STOT RE2 but primarily via inhalation.
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		ECHA C&L database/NICNAS	An EU harmonised classification is not available for amorphous silica fume. The industry data submissions to the C&L database indicate that it does not meet the criteria. NICNAS noted has been identified as potential carcinogen but via inhalation route.
If answer to any question is YES, substance is toxic *If answer to all questions is NO, substance is not toxic*				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No**			
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	Yes (see comment)			The persistence criteria are not directly applicable to metals/inorganics and were developed principally for organic substances. Metals and inorganics such as amporphous silica fume are inherently persistent.
Half life in marine, fresh or estuarine sediment ≥ 180 days Half life in soil ≥ 180 days				
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No (See comment)		Bernd/Dow Corning/ECHA CHEM	BCF studies are not directly relevant to inorganic substances such as amporphous silica fume. No BCF data is available for amorphous silica fume however it is not expected to accumulate in organisms based on its properties.
If answer is yes, substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?				
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		ECHA C&L database/NICNAS	An EU harmonised classification is not available for amorphous silica fume. The industry data submissions to the C&L database indicate that it does not meet the criteria. This is supported by data in the NICNAS review
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	**No**			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			

equivalent risk phrases: T;R23/24/25, T+;R26/27/28 *(does not include Xn; R20, Xn;R21, Xn;R22)*
* equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 *(does not include R33, R67, Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61 *(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)*

Does substance have breakdown products of concern? No

REFERENCES

ECHA C&L database http://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/70815
ECHA-CHEM https://echa.europa.eu/registration-dossier/-/registered-dossier/16156/6/2/6
NICNAS https://www.nicnas.gov.au/chemical-information/imap-assessments/imap-group-assessment-report?assessment_id=1120
Dow Corning http://www.dowcorning.co.kr/ko_KR/content/about/aboutehs/EHSPortalFiles/GPS_Safety_Report_69012-64-2.pdf
Bernd (2006) http://www.iibcc.biz/wp-content/uploads/2015/11/iibcc_o2-1.pdf

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SUMMARY: NON-HAZARDOUS	Yes / No / Insuffcent data / Borderline / assume yes or no?	Value	Reference	Comments
				Bentonite (CAS: 1302-78-9)
Is substance persistent, bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test	No data		EHC	Bentonite is a mineral clay which occurs widely in the environment. The persistence crtieria are not directly applicable to metals/inorganics and were developed principally for organic substances. Data is not available on the biodegradability of bentonite however it is not expected to biodegrade to any significant extent based on its composition.
Passes inherent biodegradation test	No data			
If answer to either question is YES, substance is not persistent				
If answer to both questions is NO, additional data on half life is required				
Half life marine water ≥ 60 days	No data		EHC	
Half life fresh or estuarine water ≥ 40 days	No data			Bentonite is a mineral clay which occurs widely in the environment. The persistence crtieria are not directly applicable to metals/inorganics and were developed principally for organic substances. Data is not available on the biodegradability of bentonite however it is not expected to biodegrade to any significant extent based on its composition.
Half life marine sediment ≥ 180 days	No data			
Half life fresh or estuarine sediment ≥ 120 days	No data			
Half life in soil ≥ 120 days	No data			
If answer to any question is YES, substance is persistent				
If answer to all questions is NO, substance is not persistent				
Is sufficient data available? (if not assume substance is persistent)	No			
Is substance persistent?	**Yes**			**Bentonite is a mineral clay which occurs widely in the environment. The persistence crtieria are not directly applicable to metals/inorganics and were developed principally for organic substances. Data is not available on the biodegradability of bentonite however it is not expected to biodegrade to any significant extent based on its composition.**
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No data (see comment)		EHC	No BCF data is available for bentonite. BCF studies are not directly relevant to inorganic substances such as bentonite. However it is not expected to accumulate in organisms (EHC)
Does field data show evidence for biomagnification?				
If answer to either question is YES, substance is bioaccumulative				
If no BCF data, is log Kow ≥ 4.5?	No data (see comment)			Log Kow values are not applicable to inorganics
If answer is YES, substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely?	Not assessed			
Substance is chronically non-toxic in mammals				
Molecular size ≥ 4.3nm				
Molecular weight ≥ 1100g/mol				
Octanol solubility ≤ 0.002mmol/l				
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative				
If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**			**Although no BCF data were located and log Kow was not obtained as not relevant to bentonite overall information on the mineral bentonite indicates that it is not likely to bioaccumulate in tissues.**
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No		HSDB/Ecotox/EHC	No chronic aquatic toxicity data was located however an acute study on the fish Onchorhynchus mykiss indicates that it is of low acute toxicity with acute effects at a concentration of 19000mg/l. This indicates that it is unlikely to meet the criteria for chronic toxicity. The EHC report states that it is of low toxicity to aquatic life.
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		ECHA C&L database	An EU harmonised classification is not available for bentonite. The majority of industry submissions to the database indicate that it does not meet these criteria. Some of the submissions indicate it may meet the STOT RE1 classification however this is noted to be in relation to effects on the lungs through inhalation.
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		ECHA C&L database/EFSA (2017)	An EU harmonised classification is not available for bentonite. Industry submissions to the database do not indicate that it meets these criteria
If answer to any question is YES, substance is toxic				
If answer to all questions is NO, substance is not toxic				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No**			
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	No data		EHC	Bentonite is a mineral clay which occurs widely in the environment. Data is not available on the biodegradability of bentonite however it is not expected to biodegrade to any significant extent based on its composition.
Half life in marine, fresh or estuarine sediment ≥ 180 days				
Half life in soil ≥ 180 days				
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No data		EHC	No BCF data is available for bentonite. However it is not expected to accumulate in organisms
If answer is yes, substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?				
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		ECHA C&L database/EFSA (2017)	An EU harmonised classification is not available for bentonite. Industry submissions to the database do not indicate that it meets these criteria. A review by EFSA (2017) reported that the available data did not indicate it was mutagenic.
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	**No**			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			**Limited data is available on bentonite. It is a mineral that is found naturally in the environment and has a range of uses. The weight of evidence indicates it does not meet the criteria for Hazardous**

equivalent risk phrases: T;R23/24/25, T+;R26/27/28 *(does not include Xn; R20, Xn;R21, Xn;R22)*
* equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 *(does not include R33, R67, Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61 *(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)*

Does substance have breakdown products of concern? No

REFERENCES

Environmental Health Criteria 231: Bentonite, kaolin and selected clay minerals (http://www.who.int/ipcs/publications/ehc/ehc_231.pdf
ECHA C&L database https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/116081
HSDB http://toxnet.nlm.nih.gov/cgi-bin/sis/search2/f?./temp/~NpciZu:1
EFSA (2017) https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2017.5096

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Calcium chloride (CAS: 10043-52-4)

SUMMARY: NON-HAZARDOUS	Yes / No / Insufficent data / Borderline / assume yes or no?	Value	Reference	Comments
Is substance persistent, bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test	See comment			The persistence criteria are not directly applicable to metals/inorganics and were developed principally for organic substances (see comment below)
Passes inherent biodegradation test				
If answer to either question is YES, substance is not persistent				
If answer to both questions is NO, additional data on half life is required				
Half life marine water ≥ 60 days	See comment			The persistence criteria are not directly applicable to metals/inorganics and were developed principally for organic substances (see comment below)
Half life fresh or estuarine water ≥ 40 days				
Half life marine sediment ≥ 180 days				
Half life fresh or estuarine sediment ≥ 120 days				
Half life in soil ≥ 120 days				
If answer to any question is YES, substance is persistent				
If answer to all questions is NO, substance is not persistent				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**Yes (see comment)**			**The persistence criteria are not directly applicable to metals/inorganics and were developed principally for organic substances. Calcium chloride will dissociate in the water environment to form calcium and chloride ions. These ions will remain in the environment as free ions or form stable inorganic or organic salts with other counter ions. As the ions do not degrade have considered as persistent for the purposes of this assessment.**
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No (see comment)		SIDS (2002)	BCF studies are not directly relevant to inorganic substances such as calcium chloride. Calcium chloride will dissociate in the water environment to form calcium and chloride ions. Neither of these ions are considered to accumulate in the tissues of organisms (OECD SIDS, 2002)
Does field data show evidence for biomagnification?				
If answer to either question is YES, substance is bioaccumulative				
If no BCF data, is log Kow ≥ 4.5?	Log Kow values are not applicable to metals/inorganics			Log Kow are not considered reliable estimates of the potential for bioaccumulation of inorganic substances such as calcium chloride. It will dissociate in the water environment to form calcium and chloride ions.
If answer is YES, substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely? Substance is chronically non-toxic in mammals Molecular size ≥ 4.3nm Molecular weight ≥ 1100g/mol Octanol solubility ≤ 0.002mmol/l	Not assessed due to the above information			
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative				
If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**			**Although neither BCF or log Kow data is available for this substance the available information for this compound indicates that it will not bioaccumulate.**
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No	320mg/l	SIDS (2002)	The limited chronic data available indicates that it is of low chronic toxicity to the species studied. The value of 320mg/l is the 21d EC16 for the invertebrate Daphnia magna. A chronic endpoint for the alga Selenastrum capricornutum indicates low toxicity with a 3d EC20 of 1000mg/l. This limited chronic data is supported by the available acute toxicity data which indicates low acute toxicit with effect concentrations noted at concentrations >1000mg/l.
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		ECHA C&L database	An EU harmonised classification is available for calcium chloride. The classificaiton indicates that it does not meet these criteria Both calcium and chloride are essential components in animals. Daily intake of more than 1000mg/l is recommended for both ions (SIDS, 2002). They are also essential for plant life.
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		ECHA C&L database	An EU harmonised classification is available for calcium chloride. The classificaiton indicates that it does not meet these criteria
If answer to any question is YES, substance is toxic				
If answer to all questions is NO, substance is not toxic				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No**			**The available data indicate that calcium chloride does not meet the criteria for chronic toxicity to aquatic organisms and impact on human health.**
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	Yes (See comment)			The persistence criteria are not directly applicable to metals/inorganics and were developed principally for organic substances. Calcium chloride will dissociate in the water environment to form calcium and chloride ions. These ions will remain in the environment as free ions or form stable inorganic or organic salts with other counter ions. As the ions do not degrade have considered as persistent for the purposes of this assessment.
Half life in marine, fresh or estuarine sediment ≥ 180 days	Yes (See comment)			
Half life in soil ≥ 180 days	Yes (See comment)			
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No		SIDS (2002)	BCF studies are not directly relevant to inorganic substances such as calcium chloride. Calcium chloride will dissociate in the water environment to form calcium and chloride ions. Neither of these ions are considered to accumulate in the tissues of organisms (OECD SIDS, 2002)
If answer is yes, substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?				
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		ECHA C&L database	An EU harmonised classification is available for calcium chloride. Based on the classification calcium chloride does not meet this criteria
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	**No**			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			

equivalent risk phrases: T;R23/24/25, T+;R26/27/28 *(does not include Xn; R20, Xn;R21, Xn;R22)*
* equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 *(does not include R33, R67, Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61 *(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)*

Does substance have breakdown products of concern? No

REFERENCES

OECD SIDS (2002) Calcium chloride http://webnet.oecd.org/Hpv/UI/handler.axd?id=cb4247c6-7f28-4ca5-bf69-1f526956b6f9
ECHA C&L database http://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/61013

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Citric acid monohydrate (CAS: 5949-29-1)

Limited data was available for citric acid monohydrate and have therefore used information for the anhydrous form ie citric acid (CAS: 77-92-9)

SUMMARY: NON-HAZARDOUS	Yes / No / Insufficent data / Borderline / assume yes or no?	Value	Reference	Comments
Is substance persistent. bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test	Yes		SIDS (2001)/EU (2016)	A number of studies were reported which indicated ready biodegradation with some studies noting 98% and 97% degradation. It is noted as readily biodegradable in the EU (2014) assessment report
Passes inherent biodegradation test	Yes		SIDS (2001)/EU (2016)	A number of studies were reported which indicated ready biodegradation.
If answer to either question is YES, substance is not persistent *If answer to both questions is NO, additional data on half life is required*				
Half life marine water ≥ 60 days Half life fresh or estuarine water ≥ 40 days Half life marine sediment ≥ 180 days Half life fresh or estuarine sediment ≥ 120 days Half life in soil ≥ 120 days	See comment			No specific information was obtained on degradation half lives however as noted above the available data indicated ready biodegradation
If answer to any question is YES, substance is persistent *If answer to all questions is NO, substance is not persistent*				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**No**			
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No	0.000127	EU (2016)	No measured BCF data were located. An estimated BCF of 0.000127 was reported in the EU assessment based on a calculation using the log Kow of -3.76
Does field data show evidence for biomagnification? *If answer to either question is YES, substance is bioaccumulative*				
If no BCF data, is log Kow ≥ 4.5?	No	-3.76	EU(2016)	This log Kow indicates it does not meet the criteria. This value is supported by a log Kow of -1.72 reported in the SIDS (2001) document.
If answer is YES, substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely? Substance is chronically non-toxic in mammals Molecular size ≥ 4.3nm Molecular weight ≥ 1100g/mol Octanol solubility ≤ 0.002mmol/l	Not considered due to the above information			
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative *If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained*				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**			
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No		SIDS (2001)	No chronic data was located. The lowest acute effect concentration was a 3d EC50 of 1.9mg/l noted in the EU(2016) assessment for the biocides directive. The latter also notes that the effect of citric acid on pH is one of the key effects on aquatic life. An acute effect on invertebrates of 34mg/l and of fish of 440mg/l were noted in the EU assessment. This is supported by acute toxicity data for invertebrates and fish in the range of 440-1535mg/l in the SIDS (2001) report. The available data indicate it is not expected to meet the criteria for chronic toxicity.
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		ECHA C&L database and SIDS (2001)	An EU harmonised classification is not available for citric acid . A proposed classification noted in the EU (2016) assessment indicates that it does not meet these criteria. This is supported by available data in the EU assessment as well as the SIDS (2001) report. Citric acid is approved for use as a food additive and also occurs naturally in plants and animals
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		ECHA C&L database and SIDS (2001)	An EU harmonised classification is not available for citric acid . A proposed classification noted in the EU (2016) assessment indicates that it does not meet these criteria. This is supported by available data in the EU assessment as well as the SIDS (2001) report. Citric acid is approved for use as a food additive and also occurs naturally in plants and animals
If answer to any question is YES, substance is toxic *If answer to all questions is NO, substance is not toxic*				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No**			
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days Half life in marine, fresh or estuarine sediment ≥ 180 days Half life in soil ≥ 180 days	No		SIDS (2001)/EU (2016)	No specific information was obtained on degradation half lives however the available data indicated ready biodegradation
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No	0.000127	EU (2016)	No measured BCF data were located. An estimated BCF of 0.000127 was reported in the EU assessment based on a calculation using the log Kow of -3.76
If answer is yes, substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?				
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		ECHA C&L database and SIDS (2001)	An EU harmonised classification is not available for citric acid . A proposed classification noted in the EU (2016) assessment indicates that it does not meet these criteria. This is supported by available data in the EU assessment as well as the SIDS (2001) report. Citric acid is approved for use as a food additive and also occurs naturally in plants and animals
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	**No**			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			

equivalent risk phrases: T;R23/24/25, T+;R26/27/28 *(does not include Xn; R20, Xn;R21, Xn;R22)*
* equivalent risk phrases T:R39/23/24/25, T+;R26/27/28, T:R48/23/24/25 *(does not include R33. R67. Xi: R37. Xn;R4820/21/22. Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61 *(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)*

Does substance have breakdown products of concern? No

REFERENCES

SIDS (2001) - Citric acid http://webnet.oecd.org/Hpv/UI/handler.axd?id=ff78c453-36c1-430d-9034-63e15899d24b
EU (2016) - Evaluation of active substances - Assessment Report http://dissemination.echa.europa.eu/Biocides/ActiveSubstances/1271-02/1271-02_Assessment_Report.pdf

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SUMMARY: NON-HAZARDOUS	Citric acid (CAS: 77-92-9)			
	Yes / No / Insuffcent data / Borderline / assume yes or no?	Value	Reference	Comments
Is substance persistent, bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test	Yes		SIDS (2001)/EU (2016)	A number of studies were reported which indicated ready biodegradation with some studies noting 98% and 97% degradation. It is noted as readily biodegradable in the EU (2014) assessment report
Passes inherent biodegradation test	Yes		SIDS (2001)/EU (2016)	A number of studies were reported which indicated ready biodegradation.
If answer to either question is YES, substance is not persistent *If answer to both questions is NO, additional data on half life is required*				
Half life marine water ≥ 60 days Half life fresh or estuarine water ≥ 40 days Half life marine sediment ≥ 180 days Half life fresh or estuarine sediment ≥ 120 days Half life in soil ≥ 120 days	See comment			No specific information was obtained on degradation half lives however as noted above the available data indicated ready biodegradation
If answer to any question is YES, substance is persistent *If answer to all questions is NO, substance is not persistent*				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**No**			
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No	0.000127	EU (2016)	No measured BCF data were located. An estimated BCF of 0.000127 was reported in the EU assessment based on a calculation using the log Kow of -3.76
Does field data show evidence for biomagnification? *If answer to either question is YES, substance is bioaccumulative*				
If no BCF data, is log Kow ≥ 4.5?	No	-3.76	EU(2016)	This log Kow indicates it does not meet the criteria. This value is supported by a log Kow of -1.72 reported in the SIDS (2001) document.
If answer is YES. substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely? Substance is chronically non-toxic in mammals Molecular size ≥ 4.3nm Molecular weight ≥ 1100g/mol Octanol solubility ≤ 0.002mmol/l	Not considered due to the above information			
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative *If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained*				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**			
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No		SIDS (2001)	No chronic data was located. The lowest acute effect concentration was a 3d EC50 of 1.9mg/l noted in the EU(2016) assessment for the biocides directive. The latter also notes that the effect of citric acid on pH is one of the key effects on aquatic life. An acute effect on invertebrates of 34mg/l and of fish of 440mg/l were noted in the EU assessment. This is supported by acute toxicity data for invertebrates and fish in the range of 440-1535mg/l in the SIDS (2001) report. The available data indicate it is not expected to meet the criteria for chronic toxicity.
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		ECHA C&L database and SIDS (2001)	An EU harmonised classification is not available for citric acid . A proposed classification noted in the EU (2016) assessment indicates that it does not meet these criteria. This is supported by available data in the EU assessment as well as the SIDS (2001) report. Citric acid is approved for use as a food additive and also occurs naturally in plants and animals
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		ECHA C&L database and SIDS (2001)	An EU harmonised classification is not available for citric acid . A proposed classification noted in the EU (2016) assessment indicates that it does not meet these criteria. This is supported by available data in the EU assessment as well as the SIDS (2001) report. Citric acid is approved for use as a food additive and also occurs naturally in plants and animals
If answer to any question is YES, substance is toxic *If answer to all questions is NO, substance is not toxic*				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No**			
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days Half life in marine, fresh or estuarine sediment ≥ 180 days Half life in soil ≥ 180 days	No		SIDS (2001)/EU (2016)	No specific information was obtained on degradation half lives however the available data indicated ready biodegradation
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No	0.000127	EU (2016)	No measured BCF data were located. An estimated BCF of 0.000127 was reported in the EU assessment based on a calculation using the log Kow of -3.76
If answer is yes, substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?				
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		ECHA C&L database and SIDS (2001)	An EU harmonised classification is not available for citric acid . A proposed classification noted in the EU (2016) assessment indicates that it does not meet these criteria. This is supported by available data in the EU assessment as well as the SIDS (2001) report. Citric acid is approved for use as a food additive and also occurs naturally in plants and animals
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	No			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			

equivalent risk phrases: T;R23/24/25, T+;R26/27/28 *(does not include Xn; R20, Xn;R21, Xn;R22)*
* equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 *(does not include R33, R67, Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61 *(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)*

Does substance have breakdown products of concern? No

REFERENCES

SIDS (2001) - Citric acid http://webnet.oecd.org/Hpv/UI/handler.axd?id=ff78c453-36c1-430d-9034-63e15899d24b
EU (2016) - Evaluation of active substances - Assessment Report http://dissemination.echa.europa.eu/Biocides/ActiveSubstances/1271-02/1271-02_Assessment_Report.pdf

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Crystalline quartz, silica (CAS: 14808-60-7)

SUMMARY: NON-HAZARDOUS	Yes / No / Insufficent data / Borderline / assume yes or no?	Value	Reference	Comments
Is substance persistent, bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test	See comment			The persistence criteria are not directly applicable to metals/inorganics and were developed principally for organic substances (see comment below).
Passes inherent biodegradation test				
If answer to either question is YES, substance is not persistent				
If answer to both questions is NO, additional data on half life is required				
Half life marine water ≥ 60 days	See comment			The persistence criteria are not directly applicable to metals/inorganics and were developed principally for organic substances (see comment below).
Half life fresh or estuarine water ≥ 40 days				
Half life marine sediment ≥ 180 days				
Half life fresh or estuarine sediment ≥ 120 days				
Half life in soil ≥ 120 days				
If answer to any question is YES, substance is persistent				
If answer to all questions is NO, substance is not persistent				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**Yes**		Environment Canada (2013)	The persistence criteria are not directly applicable to metals/inorganics and were developed principally for organic substances. Metals and inorganics such as crystalline quartz, silica are inherently persistent. An assessment by Environment Canada noted that crystalline quartz, silica is persistent.
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No data (see comment)		Environment Canada (2013)	BCF studies are not direclty relevant to inorganic substancees such as crystallkine quartz. No BCF data was located. Environment Canada (2013) noted that it is not expected to bioaccumulate in aquatic organisms as it has limited potential for uptake, eg through gills or the gut.
Does field data show evidence for biomagnification?				
If answer to either question is YES, substance is bioaccumulative				
If no BCF data, is log Kow ≥ 4.5?	Log Kow values are not applicable to inorganics		Environment Canada (2013)	Environment Canada (2013) notes that the log Kow is not applicable for crystalline quartz, silica
If answer is YES, substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely? Substance is chronically non-toxic in mammals Molecular size ≥ 4.3nm Molecular weight ≥ 1100g/mol Octanol solubility ≤ 0.002mmol/l	Not considered due to the above data			
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative				
If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**			
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No		Environment Canada (2013)	No aquatic toxicity data was located however the Environment Canada assessment noted that it was not inherently toxic to aquatic organisms. Data for a similar compound was reported which showed very low acute toxicity with effect concentrations of >10000mg/l being reported. This acute data supports the indication that it is not expected to be of high chronic toxicity. Limited uptake due to its crystalline nature and low solubility also supports the fact it is likely to be of low chronic toxicity.
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		ECHA C&L database, Environment Canada, NICNAS, CICADS	Crystalline quartz, silica has not been formally classified under C&L however information has been submitted to the C&L database. This indicates STOT RE1 and RE2. These proposed classifications however are in relation to effects on lungs following inhalation rather than impacts arising as a result of oral consumption. The adverse effects as a result of inhalation are documented in a number of reviews including that by Environment Canada, NICNAS and CICADS
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		ECHA C&L database, Environment Canada, NICNAS, CICADS	Crystalline quartz, silica has not been formally classified under C&L however information has been submitted to the C&L database. This indicates Carc 1A/Carc 2. These proposed classifications relate to effects on lungs following inhalation rather than impacts arising as a result of oral consumption. The adverse effects as a result of inhalation are documented in a number of reviews including that by Environment Canada, NICNAS and CICADS
If answer to any question is YES, substance is toxic				
If answer to all questions is NO, substance is not toxic				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No**			
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	No		Environment Canada (2013)	The persistence criteria are not directly applicable to metals/inorganics and were developed principally for organic substances. Metals and inorganics such as crystalline quartz, silica are inherently persistent. An assessment by Environment Canada noted that crystalline quartz, silica is persistent.
Half life in marine, fresh or estuarine sediment ≥ 180 days				
Half life in soil ≥ 180 days				
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No data		Environment Canada (2013)	BCF studies are not direclty relevant to inorganic substancees such as crystallkine quartz. No BCF data was located. Environment Canada (2013) noted that it is not expected to bioaccumulate in aquatic organisms as it has limited potential for uptake, eg through gills or the gut.
If answer is yes, substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?	Not assessed			
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	**Not assessed**			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		ECHA C&L database, Environment Canada, NICNAS, CICADS	Crystalline quartz, silica has not been formally classified under CLP however information has been submitted to the CLP database. This indicates Carc 1A/Carc 2 however this was in relation to effects on lungs following inhalation rather than impacts arising as a result of oral consumption. Mutagenic effects have not been reported in reviews that have been undertakenn by Environment Canada, NICNAS and CICADS.
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	**No**			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			

equivalent risk phrases: T;R23/24/25, T+;R26/27/28 *(does not include Xn; R20, Xn;R21, Xn;R22)*
* equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 *(does not include R33, R67. Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61 *(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)*

Does substance have breakdown products of concern? No

REFERENCES

ECHA CLP database https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/54394
Environment Canada (2013) http://webnet.oecd.org/Hpv/UI/handler.axd?id=d1efc3a6-3499-467a-b0a1-9b1351924e57
NICNAS https://www.nicnas.gov.au/chemical-information/imap-assessments/imap-group-assessment-report?assessment_id=1120
CICAD (2000) http://www.who.int/ipcs/publications/cicad/en/cicad24.pdf

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SUMMARY: NON-HAZARDOUS	Yes / No / Insufficent data / Borderline / assume yes or no?	Value	Reference	Comments
				Diammonium peroxidisulphate (CAS: 7727-54-0)
Is substance persistent, bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test				The persistence criteria are not directly applicable to metals/inorganics and were developed principally for organic substances (see comment below).
Passes inherent biodegradation test				
If answer to either question is YES, substance is not persistent				
If answer to both questions is NO, additional data on half life is required				
Half life marine water ≥ 60 days				
Half life fresh or estuarine water ≥ 40 days	No	20-210hours	SIDS (2005)	The available information indicates that hydrolysis is the key degradation route for diammonium peroxidisulphate. Hydrolysis half lives in the order of 20-210hours has been reported at different pH. In water it will primarily be in the form of the ions, ie ammonium and sulphate ions following hydrolysis.
Half life marine sediment ≥ 180 days				
Half life fresh or estuarine sediment ≥ 120 days				
Half life in soil ≥ 120 days				
If answer to any question is YES, substance is persistent				
If answer to all questions is NO, substance is not persistent				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**No**			**The persistence criteria are not direclty applicable to metals /inorganics such as diammonium peroxidisulphate and were developed principally for organic substances. The available data indicates that it will hydrolyse to form ammonium and sulphate ions . Ammonium ions will mineralise to nitrite.**
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No data (See comment)		SIDS (2005)	BCF data are not directly applicable to inorganic substances such as diammonium peroxidisulphate. No BCF information was available however based on the nature of the substance and it will form ions in water it is not anticipated to bioaccumulate (SIDS 2005)
Does field data show evidence for biomagnification?				
If answer to either question is YES. substance is bioaccumulative				
If no BCF data, is log Kow ≥ 4.5?	See comment			As this is an inorganic substance a log Kow is not applicable
If answer is YES, substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely? Substance is chronically non-toxic in mammals Molecular size ≥ 4.3nm Molecular weight ≥ 1100g/mol Octanol solubility ≤ 0.002mmol/l	Not considered due to the above data			
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative				
If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**			
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No		SIDS (2005)	No chronic NOEC data was located however the acute toxicity data for fish, invertebrates and fish indicate low toxicity with acute effects to fish in the range of 76-323mg/l, invertebrates 120-391mg/l and algae 84mg/l. This indicates not expected to meet criteria for toxicity
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		ECHA CLP database	A harmonised classification shows that it does not meet these criteria
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		ECHA CLP database	A harmonised classification shows that it does not meet these criteria
If answer to any question is YES, substance is toxic				
If answer to all questions is NO, substance is not toxic				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No**			
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	No	20-210hours	SIDS (2005)	The available information indicates that hydrolysis is the key degradation route for diammonium peroxidisulphate. Hydrolysis half lives in the order of 20-210hours has been reported at different pH. In water it will primarily be in the form of the ions, ie ammonium and sulphate ions following hydrolysis.
Half life in marine, fresh or estuarine sediment ≥ 180 days				
Half life in soil ≥ 180 days				
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No		SIDS (2005)	BCF data are not directly applicable to inorganic substances such as diammonium peroxidisulphate. No BCF information was available however based on the nature of the substance and it will form ions in water it is not anticipated to bioaccumulate (SIDS 2005)
If answer is ves. substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?	Not assessed			
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		ECHA C&L database	A harmonised classification shows that it does not meet the criteria for mutagenicity
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	**No**			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			
Does substance have known breakdown products of concern? *(Determinations on known key breakdown products will be undertaken if known. It is acknowledged in the methodology that it is not possible to assess every breakdown product)*	No			

equivalent risk phrases: T;R23/24/25, T+;R26/27/28 *(does not include Xn; R20, Xn;R21, Xn;R22)*
* equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 *(does not include R33, R67, Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61 *(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)*

REFERENCES

SIDS (2005) http://webnet.oecd.org/Hpv/UI/handler.axd?id=0040c6d0-05b7-4769-9f71-d2ade872183b
ECHA CLP database https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/91227

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SUMMARY: NON-HAZARDOUS	Yes / No / Insufficent data / Borderline / assume yes or no?	Value	Reference	Comments
				D-limonene (CAS: 5989-27-5)
Is substance persistent, bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test	Yes		CICAD/ECHA-CHEM	A study was reported in the CICAD report which indicated 41-98% degradation in 14days in aerobic environment (OECD 301C). A study in ECHA CHEM noted 80% degradation after 28days.
Passes inherent biodegradation test				
If answer to either question is YES, substance is not persistent				
If answer to both questions is NO, additional data on half life is required				
Half life marine water ≥ 60 days	No data (see comment)			No degradation half life data was located however as noted above several studies were reported as showing ready biodegradability
Half life fresh or estuarine water ≥ 40 days				
Half life marine sediment ≥ 180 days				
Half life fresh or estuarine sediment ≥ 120 days				
Half life in soil ≥ 120 days				
If answer to any question is YES, substance is persistent				
If answer to all questions is NO, substance is not persistent				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**No**			
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No	246-262	CICAD	No experimental BCF data was located. A BCF of 246 - 262, estimated based on the Log Kow data, was noted in the CICAD report. ECHA-CHEM noted BCF of 377 and 908 based on OSAR.
Does field data show evidence for biomagnification?				
If answer to either question is YES, substance is bioaccumulative				
If no BCF data, is log Kow ≥ 4.5?	No	4.23	CICAD	A calculated log Kow of 4.23 was noted in the CICAD report
If answer is YES, substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely?	Not assessed due to the above data			
Substance is chronically non-toxic in mammals				
Molecular size ≥ 4.3nm				
Molecular weight ≥ 1100g/mol				
Octanol solubility ≤ 0.002mmol/l				
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative				
If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**			**No measured BCF data was available however estimated values, ranging from 246 - 908 indicated that it did not meet the criteria.**
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No	0.15mg/l	NICNAS	A modelled chronic value of 0.15mg/l was noted for the invertebrate Daphnia magna. A measured NOEC of 0.08mg/l was noted on ECHA CHEM for the invertebrate Daphnia magna
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		ECHA C&L database	A harmonised CLP classification is available for d-limonene. This indicates that it does not meet these criteria
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		ECHA C&L database	A harmonised CLP classification is available for d-limonene. This indicates that it does not meet these criteria
If answer to any question is YES, substance is toxic				
If answer to all questions is NO, substance is not toxic				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No**			
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	No (see comment)		CICAD/ECHA-CHEM	No degradation half life data was located however as noted above several studies were reported as showing ready biodegradability
Half life in marine, fresh or estuarine sediment ≥ 180 days				
Half life in soil ≥ 180 days				
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No	246-262	CICAD	No experimental BCF data was located. A BCF of 246 - 262 was noted in the CICAD report which had been estimated based on the log Kow data. ECHA-CHEM noted BCF of 377 and 908 based on QSAR.
If answer is yes, substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?	Not assessed			
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		ECHA C&L database	A harmonised CLP classification is available for d-limonene. This indicates that it does not meet these criteria
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	**No**			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			

equivalent risk phrases: T;R23/24/25, T+;R26/27/28 *(does not include Xn: R20, Xn;R21, Xn;R22)*
* equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 *(does not include R33, R67, Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61
(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)

Does substance have breakdown products of concern? No

REFERENCES

CICAD http://www.who.int/ipcs/publications/cicad/en/cicad05.pdf
ECHA-CHEM https://echa.europa.eu/registration-dossier/-/registered-dossier/15256/5/4/2
EU C&L database https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/66519
NICNAS (2001) https://www.nicnas.gov.au/__data/assets/word_doc/0007/34828/PEC22-limonene.docx

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SUMMARY: NON-HAZARDOUS	Yes / No / Insufficent data / Borderline / assume yes or no?	Value	Reference	Comments
			Isopropanol (CAS: 67-63-0)	
Is substance persistent, bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test	Yes		EU (2015)	Isopropanol was noted to be readily biodegradable based on an OECD 301C study. This is supported by data in the SIDS report which also indicated readily biodegraded with 72-78% degradation noted over 20days.
Passes inherent biodegradation test				
If answer to either question is YES, substance is not persistent				
If answer to both questions is NO, additional data on half life is required				
Half life marine water ≥ 60 days	Not considered due to the above			
Half life fresh or estuarine water ≥ 40 days				
Half life marine sediment ≥ 180 days				
Half life fresh or estuarine sediment ≥ 120 days				
Half life in soil ≥ 120 days				
If answer to any question is YES, substance is persistent				
If answer to all questions is NO, substance is not persistent				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**No**			
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No	1	SIDS	A BCF of 1 was estimated based on a log Kow of 0.05. This indicates that it does not meet the criteria for accumulation
Does field data show evidence for biomagnification?				
If answer to either question is YES, substance is bioaccumulative				
If no BCF data, is log Kow ≥ 4.5?	No	0.05	SIDS/ EU(2015)	A log Kow of 0.05 was calculated which indicates the criteria for bioaccumulation are not met
If answer is YES, substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikelv?	Not considered due to the above			
Substance is chronically non-toxic in mammals				
Molecular size ≥ 4.3nm				
Molecular weight ≥ 1100g/mol				
Octanol solubility ≤ 0.002mmol/l				
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative				
If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**			
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No	30mg/l	SIDS/EU 2015	A chronic study was reported for Daphnia magna which gave a 21day NOEC of 30mg/l. This indicates it does not meet the criteria for chronic toxicity. No other chronic data was located however the results of various acute studies indicates acute effects to algae, invertebrates and fish in the range of 1400 - >10000mg/l. This supports the chronic data in indicating it does not meet the criteria
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		ECHA C&L database	An EU harmonised C&L classification is avaialble for isopropanol. The classification shows the criteria are not met
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		ECHA C&L database	An EU harmonised C&L classification is avaialble for isopropanol. The classification shows the criteria are not met
If answer to any question is YES, substance is toxic				
If answer to all questions is NO, substance is not toxic				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No**			
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	No		EU (2015)	Half life degradation data is not available however reports of ready biodegradability studies indicate that isopropanol is readily biodegradable
Half life in marine, fresh or estuarine sediment ≥ 180 days				
Half life in soil ≥ 180 days				
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No	1	SIDS	A BCF of 1 was estimated based on a log Kow of 0.05. This indicates that it does not meet the criteria for accumulation
If answer is ves, substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?				
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		ECHA C&L database	An EU harmonised C&L classification is avaialble for isopropanol. The classification shows the criteria are not met
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	**No**			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			

equivalent risk phrases: T:R23/24/25. T+:R26/27/28 *(does not include Xn: R20. Xn:R21. Xn:R22)*
* equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 *(does not include R33, R67, Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61
(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)

Does substance have breakdown products of concern? No

REFERENCES

ECHA C&L database http://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/22308
SIDS http://webnet.oecd.org/Hpv/UI/handler.axd?id=668b6b61-3645-491e-a423-1a7100bc6598
ECHA-CHEM https://echa.europa.eu/brief-profile/-/briefprofile/100.000.601
EU Assessment report (2015) http://dissemination.echa.europa.eu/Biocides/ActiveSubstances/1355-01/1355-01_Assessment_Report.pdf
EU Biocides https://echa.europa.eu/information-on-chemicals/biocidal-active-substances?p_p_id=echarevbiocides_WAR_echarevbiocidesportlet&p_p_lifecycle=1&p_p_state=normal&p_p_mode=view&p_p_col_id=column-

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SUMMARY: NON-HAZARDOUS	Maltodextrin (CAS: 9050-36-6)			
	Yes / No / Insufficent data / Borderline / assume yes or no?	Value	Reference	Comments
Is substance persistent, bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test	No data (see summary comment)			
Passes inherent biodegradation test				
If answer to either question is YES, substance is not persistent				
If answer to both questions is NO, additional data on half life is required				
Half life marine water ≥ 60 days	No data (see summary comment)			
Half life fresh or estuarine water ≥ 40 days				
Half life marine sediment ≥ 180 days				
Half life fresh or estuarine sediment ≥ 120 days				
Half life in soil ≥ 120 days				
If answer to any question is YES, substance is persistent				
If answer to all questions is NO, substance is not persistent				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**No (See comment)**			**Maltodextrin is a polysaccharide that is produced as a result of the degradation of starch. No specific degradation half life data was located for maltodextrin. It is noted to be biodegradable in the EFSA report (2013) which reviewed its fate in the environment. The EFSA report notes that degradation data was not provided but was not required.**
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No data (see summary comment)			No specific BCF data was located for this substance.
Does field data show evidence for biomagnification?				
If answer to either question is YES, substance is bioaccumulative				
If no BCF data, is log Kow ≥ 4.5?	No data (see summary comment)			No specific log Kow data was located for this substance
If answer is YES, substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely?	Not assessed			
Substance is chronically non-toxic in mammals				
Molecular size ≥ 4.3nm				
Molecular weight ≥ 1100g/mol				
Octanol solubility ≤ 0.002mmol/l				
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative				
If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**			**No specific information was located on the bioaccumulation of maltodextrin. The weight of evidence however indicates that maltodextrin is unlikely to meet these criteria based on the fact it is considered low hazard (see final summary comment).**
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No (see comment)		ECHA C&L database	No chronic aquatic toxicity data was located. The industry submissions to the C&L database indicate it does not meet the criteria for aquatic toxicity. Aquatic toxicity data was noted as not required for the EFSA assessment
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No (see comment)		ECHA C&L database	A formal CLP classification has not been undertaken. The industry data submissions indicate it does not meet the criteria. It is widely used as a food additive and in cosmetics and pharmaceuticals. Based on its widespread use for these purposes it is not expected to meet these criteria. The need for toxicity data was deemed unneccessary in the EFSA assessment and data waivers were made for specific toxicological studies and no quantitative risk assessment for operator, worker and by-stander exposure was considered necessary.
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No (see comment)		ECHA C&L database	A formal CLP classification has not been undertaken. The industry data submissions to the database indicate it does not meet these criteria. It is widely used as a food additive and in cosmetics and pharmaceuticals. Based on its widespread use for these purposes it is not expected to meet these criteria
If answer to any question is YES, substance is toxic				
If answer to all questions is NO, substance is not toxic				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No**			**Data to assess against the specified criteria are limited. However available data and its widespread use as a food additive indicates unlikely to meet criteria for toxicity. In addition a review by EFSA noted that based on its widespread use in food products etc it was considered to be of low toxicological concern. In addition a SIDS OECD assessment indicated that further consideration was not required due to the intrinsic properties of the substance indicating a low hazard**
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			**Limited data is available on the persistence, bioaccumulation and toxicity of maltodextrin however the weight of evidence supports the fact it would not meet the criteria for PBT. It has been considered by the OECD in the SIDS report but has been deemed to be of low priority for further consideration due to its intrinsic properties noting it is of low hazard (SIDS 2009). The EFSA assessment also noted it was considered to be low toxicological concern. This is also supported by its widespread use as a food additive. Maltodextrin is listed on Annex IV of REACH. The latter identifies substances exempted from REACH as they are considered to cause minimum risk because of their intrinsic properties**
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	No (See comment)			Maltodextrin is a polysaccharide that is produced as a result of the degradation of starch. No specific degradation half life data was located for maltodextrin. It is noted to be biodegradable in the EFSA report (2013) which reviewed its fate in the environment. The EFSA report notes that degradation data was not provided but was not required. The weight of evidence indicates it has been identified as low hazard overall (See overall summary comment below)
Half life in marine, fresh or estuarine sediment ≥ 180 days				
Half life in soil ≥ 180 days				
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No data (see summary comment)			No specific information was located on the bioaccumulation of maltodextrin. The weight of evidence however indicates that maltodextrin is unlikely to meet these criteria based on the fact it is considered low hazard (see final summary comment).
If answer is yes, substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			**See above comments**
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?	Not assessed			
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	**Not assessed**			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		ECHA C&L database/EFSA (2013)	A formal CLP classification is not available for maltodextrin. The industry submissions to the database indicate it would not meet the criteria. This is supported by statements in the EFSA report that it is of low toxicity to human health as indicated by its use as a food additive, in cosmetics and medicinal products.
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)				
Is substance very toxic?	**No (See comments)**			**Industry submissions to the CLP database database do not indicate it will meet the criteria for mutagenicity.In addition the weight of evidence that maltodextrin is of low hazard suggests it does not meet the criteria for mutagenicity (see comments in final summary section)**
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			**Limited specific data is available to assess maltodextrin against the specified criteria. Maltodextrin however is listed on Annex IV of REACH. These are substances exempted from REACH as they are considered to cause minimum risk because of their intrinsic properties. In addition a SIDS assessment on maltodextrin concluded that it is of low priority due to its intrinsic properties indicating low hazard. The weight of evidence therefore indicates that it would not be determined as Hazardous.**

equivalent risk phrases: T;R23/24/25, T+;R26/27/28 *(does not include Xn; R20, Xn;R21, Xn;R22)*
* equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 *(does not include R33, R67, Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61 *(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)*

Does substance have breakdown products of concern? No

REFERENCES

EFSA (2013) http://www.efsa.europa.eu/sites/default/files/scientific_output/files/main_documents/3007.pdf
SIDS (2009) http://webnet.oecd.org/Hpv/UI/handler.axd?id=5f507a82-2aa8-4e92-b309-0645a8156f20
ECHA C&L database https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/36347

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SUMMARY: NON-HAZARDOUS	Yes / No / Insufficent data / Borderline / assume yes or no?	Value	Reference	Comments
				Methanol (CAS: 67-56-1)
Is substance persistent, bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test	Yes	95% degradation over 20days	SIDS (2004)	The available data indicate that methanol is readily biodegradable. A study reported 95% degradation over 20days and 76-82% degradation after 5 days
Passes inherent biodegradation test				
If answer to either question is YES, substance is not persistent				
If answer to both questions is NO, additional data on half life is required				
Half life marine water ≥ 60 days	No data (See comment)			No data was located on degradation half lives however the data on ready biodegradability indicated that it was readily biodegradable.
Half life fresh or estuarine water ≥ 40 days				
Half life marine sediment ≥ 180 days				
Half life fresh or estuarine sediment ≥ 120 days				
Half life in soil ≥ 120 days				
If answer to any question is YES, substance is persistent				
If answer to all questions is NO, substance is not persistent				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**No**			
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No	<10	SIDS (2004)	BCF values for two fish species, ie Leuciscus idus and Cyprinus carpio indicated that the BCF was below 10.
Does field data show evidence for biomagnification?				
If answer to either question is YES, substance is bioaccumulative				
If no BCF data, is log Kow ≥ 4.5?	No	-0.82	SIDS (2004)	The log Kow for methanol was reported to be in the range of -0.82 to 0.64
If answer is YES, substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikelv?	Not assessed due to the above data			
Substance is chronically non-toxic in mammals				
Molecular size ≥ 4.3nm				
Molecular weight ≥ 1100g/mol				
Octanol solubility ≤ 0.002mmol/l				
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative				
If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**			
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No (see comment)		SIDS (2004)	No chronic toxicity data was located however acute data for algae, invertebrate and fish indicated low acute toxicity to the species studied with effect concentrations in the range of 20100mg/l - >10000mg/l. This low acute toxicity indicates it is not likely to meet the criteria for chronic toxicity
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		EU C&L database	An EU harmonised classification is available for methanol which indicates that it does not meet the criteria for long term toxicity
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		EU C&L database	An EU harmonised classification is available for methanol which indicates that it does not meet the criteria for CMR
If answer to any question is YES, substance is toxic				
If answer to all questions is NO, substance is not toxic				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No**			
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	No data (See comment)		SIDS (2004)	No data was located on degradation half lives however the data on ready biodegradability indicated that it was readily biodegradable.
Half life in marine, fresh or estuarine sediment ≥ 180 days				
Half life in soil ≥ 180 days				
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No	<10	SIDS (2004)	BCF values for two fish species, ie Leuciscus idus and Cyprinus carpio indicated that the BCF was below 10.
If answer is yes. substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?	Not assessed			
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		EU C&L database	An EU harmonised classification is available for methanol which indicates that it does not meet the criteria
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	**No**			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			
Does substance have known breakdown products of concern? *(Determinations on known key breakdown products will be undertaken if known. It is acknowledged in the methodology that it is not possible to assess every breakdown product)*	No			

equivalent risk phrases: T;R23/24/25, T+;R26/27/28 *(does not include Xn; R20, Xn;R21, Xn;R22)*
* equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 *(does not include R33, R67, Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61
(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)

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EU C&L database https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/37212
OECD SIDS (2004) http://webnet.oecd.org/Hpv/UI/SIDS_Details.aspx?id=39B5D34A-2F5D-4D53-B000-E497B3A3EE89

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SUMMARY: NON-HAZARDOUS	Yes / No / Insufficent data / Borderline / assume yes or no?	Value	Reference	Comments
				Poly(oxy-1,2-ethanediyl), a-butyl-w-hydroxy (CAS: 9004-77-7)
				Polyethylene glycol monobutyl ether
Is substance persistent. bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test	Yes	68 - 76% biodegradation	ECHA-CHEM	Three studies were reported in the ECHA-CHEM dataset. These indicated 68 - 76% degradation after 28days exposure which indicates ready biodegradability
Passes inherent biodegradation test				
If answer to either question is YES, substance is not persistent				
If answer to both questions is NO, additional data on half life is required				
Half life marine water ≥ 60 days	See comment			Degradation half life data was not located for this substance. However data noted in the SIDS report for a substance stated to have similar properties indicated that it was biodegradable although no degradation half lives were noted. Other similar compounds in the SIDS report were noted as readily biodegraded
Half life fresh or estuarine water ≥ 40 days				
Half life marine sediment ≥ 180 days				
Half life fresh or estuarine sediment ≥ 120 days				
Half life in soil ≥ 120 days				
If answer to any question is YES, substance is persistent				
If answer to all questions is NO, substance is not persistent				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**No**			The available data indicated it is readily biodegradable. In addition weight of evidence for similar substances indicate it does not meet the criteria for persistence.
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No data (see comment)		ECHA-CHEM	No BCF data was located for this substance
Does field data show evidence for biomagnification?				
If answer to either question is YES, substance is bioaccumulative				
If no BCF data, is log Kow ≥ 4.5?	No	0.436	ECHA-CHEM	A log Kow was noted for tetraethylene glycol butyl ether (TetraBE) in the SIDS report. This was noted to have similar properties to the substance being assessed. The low Kow was -0.26 which indicates it does not bioaccumulate.
If answer is YES, substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikelv?	Not assessed due to the above data			
Substance is chronically non-toxic in mammals				
Molecular size ≥ 4.3nm				
Molecular weight ≥ 1100g/mol				
Octanol solubility ≤ 0.002mmol/l				
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative				
If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**			**Limited data is available on the potential for this substance to bioaccumulate. The limited data available indicate that it does not meet the criteria for bioaccumulation.**
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No (see comment)		ECHA CHEM/SIDS 2002	No chronic aquatic toxicity data was located for this substance. The available acute toxicity data indicated that it was of low acute toxicity to the species studied with effect concentrations reported in the range of 310 - >3200mg/l for the algae, invertebrate and fish species studied (ECHA-CHEM). Although no chronic data is available the acute toxicity data indicates unlikely to meet the criteria for toxicity. This low toxicity was supported by data in the SIDS 2002 report.
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No (see comment)		ECHA CLP database	A harmonised classification is not available for this substance. Industry data submissions indicate that it does not meet these criteria. In addition data included in the SIDS 2002 report indicate it would not meet these criteria
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No (see comment)		ECHA CLP database	A harmonised classification is not available for this substance. Industry data submissions indicate that it does not meet these criteria. In addition data included in the SIDS 2002 report indicate it would not meet these criteria
If answer to any question is YES, substance is toxic				
If answer to all questions is NO, substance is not toxic				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No (see comment)**			**Limited data is available on the toxicity of this substance however based on the weight of evidence from the data located it is not expected to meet the criteria for Toxicity**
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	No (see comment)			The available data indicated it is readily biodegradable. In addition weight of evidence for similar substances indicate it does not meet the criteria for persistence. The limited data available indicated that it did not meet the criteria for P which indicates it will not meet the criteria for vP
Half life in marine, fresh or estuarine sediment ≥ 180 days				
Half life in soil ≥ 180 days				
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No (see comment)			No BCF or log Kow data was located for this substance. A log Kow was noted for a similar substance, ie tetraethylene glycol butyl ether (TetraBE) in the SIDS report. The low Kow was -0.26. The limited data available indicated that it did not meet the criteria for B which indicates it will not meet the criteria for vB
If answer is yes, substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?	Not assessed			
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No (see comment)		ECHA CLP database	A harmonised classification is not available for this substance. Industry data submissions indicate that it does not meet these criteria. The data reviewed in the SIDS 2002 report indicate it did not meet the criteria
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	**No**			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			
Does substance have known breakdown products of concern? *(Determinations on known key breakdown products will be undertaken if known. It is acknowledged in the methodology that it is not possible to assess every breakdown product)*	No			

equivalent risk phrases: T;R23/24/25, T+;R26/27/28 *(does not include Xn; R20, Xn;R21, Xn;R22)*
* equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 *(does not include R33, R67, Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61 *(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)*

REFERENCES

ECHA CLP database https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/77479
ECHA CHEM https://echa.europa.eu/registration-dossier/-/registered-dossier/14425
SIDS report on high boiling ethylene glycol ethers (2002) http://www.inchem.org/documents/sids/sids/eges.rev.pdf

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Sodium carbonate (CAS: 497-19-8)

SUMMARY: NON-HAZARDOUS	Yes / No / Insufficent data / Borderline / assume yes or no?	Value	Reference	Comments
Is substance persistent, bioaccumulative and toxic?				
Persistence				
Passes ready biodegredation test	See comment			The persistence criteria are not directly applicable to metals/inorganics and were developed principally for organic substances (see comment below(
Passes inherent biodegredation test	See comment			
If answer to either question is YES, substance is not persistent *If answer to both questions is NO, additional data on half life is required*				
Half life marine water ≥ 60 days	See comment			The persistence criteria are not directly applicable to metals/inorganics and were developed principally for organic substances (see comment below).
Half life fresh or estuarine water ≥ 40 days	See comment			
Half life marine sediment ≥ 180 days	See comment			
Half life fresh or estuarine sediment ≥ 120 days	See comment			
Half life in soil ≥ 120 days	See comment			
If answer to any question is YES, substance is persistent *If answer to all questions is NO, substance is not persistent*				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**Yes (see comment)**			**The persistence criteria are not directly applicable to metals/inorganics and were developed principally for organic substances. Sodium carbonate will dissociate in the water environment to form sodium and carbonate ions. The latter will transform to bicarbonate ions. The ions will persist in the environment. As a result have noted as persistent for the purposes of this assessment.**
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No data (see comment)		SIDS (2002)	BCF studies are not directl relevant to inorganic substances such as sodium carbonate. Sodium carbonate will dissociate in the water environment to form sodium and carbonate ions. Neither of these ions are considered to accumulate in the tissues of organisms (OECD SIDS, 2002)
Does field data show evidence for biomagnification? *If answer to either question is YES, substance is bioaccumulative*				
If no BCF data, is log Kow ≥ 4.5?	Log Kow values are not applicable to metals/inorganics			Log Kow are not considered reliable estimates of the potential for bioaccumulation of inorganic substances such as sodium carbonate..
If answer is YES. substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely? Substance is chronically non-toxic in mammals Molecular size ≥ 4.3nm Molecular weight ≥ 1100g/mol Octanol solubility ≤ 0.002mmol/l	Not assessed due to the above information			
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative *If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained*				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**			**Although neither BCF or log Kow data is available for this substance the available information for this compound indicates that it will not bioaccumulate.**
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No data (see comment)		SIDS (2002)	No chronic data was located for sodium carbonate. The limited acute aquatic toxicity data located indicated low toxicity to the species studied with effect concentrations for algae, inveretebrates and fish reported in the range of 67 - 740mg/l. This suggests that it is unlikely to meet the criteria for chronic toxicity of <0.01mg/l. The main impact of sodium carbonate on aquatic organisms is due to the effect of the carbonate ion on the pH of the aquatic environment. It is alkaline in nature and can therefore result in an increase in the pH of the surrounding water depending on the concentrations present and other parameters in the receiving water which buffer the effect of pH.
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		ECHA C&L database	An EU harmonised classification is available for sodium carbonate. The classification indicates it does not meet these criteria.
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		ECHA C&L database	An EU harmonised classification is available for sodium carbonate. The classification indicates it does not meet these criteria.
If answer to any question is YES, substance is toxic *If answer to all questions is NO, substance is not toxic*				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No**			
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	Yes (See comment)			The persistence criteria are not directly applicable to metals/inorganics and were developed principally for organic substances. Sodium carbonate will dissociate in the water environment to form sodium and carbonate ions. The latter will transform to bicarbonate ions. The ions will persist in the environment. As a result have noted as persistent for the purposes of this assessment.
Half life in marine, fresh or estuarine sediment ≥ 180 days	Yes (See comment)			
Half life in soil ≥ 180 days	Yes (See comment)			
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No		SIDS (2002)	BCF studies are not directl relevant to inorganic substances such as sodium carbonate. Sodium carbonate will dissociate in the water environment to form sodium and carbonate ions. Neither of these ions are considered to accumulate in the tissues of organisms (OECD SIDS, 2002)
If answer is yes, substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?				
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		ECHA C&L database	An EU harmonised classification is available for sodium carbonate. The classification indicates it does not meet these criteria.
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	**No**			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			**Sodium carbonate will dissociate to sodium and carbonate ions in the aquatic environment. Both of these ions are found widely in the environment naturally. Consideration of the available information indicates that it does not meet the criteria for assessment as Hazardous**

equivalent risk phrases: T;R23/24/25, T+;R26/27/28 *(does not include Xn; R20, Xn;R21, Xn;R22)*
* equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 *(does not include R33, R67, Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61 *(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)*

Does substance have breakdown products of concern? No

REFERENCES

ECHA C&L database http://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/6812
OECD SIDS (2002) - SIDS initial assessment profile - sodium carbonate http://webnet.oecd.org/Hpv/UIhandler.axd?id=5a6538be-aa30-4a72-ad1c-906d9b5413bd

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Sodium carboxymethyl cellulose (9004-32-4)

SUMMARY: NON-HAZARDOUS	Yes / No / Insufficent data / Borderline / assume yes or no?	Value	Reference	Comments
Is substance persistent, bioaccumulative and toxic?				
Persistence				
Passes ready biodegredation test	No data(See comment)		OSPAR (2013)	No specific data was located on the degradation rate of sodium carboxymethyl cellulose. It has been classified as PLONOR by OSPAR which indicates that it is readily biodegradable as one of the PLONOR criteria is ready biodegradability.
Passes inherent biodegredation test				
If answer to either question is YES, substance is not persistent				
If answer to both questions is NO, additional data on half life is required				
Half life marine water ≥ 60 days	No data (See summary comment)			
Half life fresh or estuarine water ≥ 40 days				
Half life marine sediment ≥ 180 days				
Half life fresh or estuarine sediment ≥ 120 days				
Half life in soil ≥ 120 days				
If answer to any question is YES, substance is persistent				
If answer to all questions is NO, substance is not persistent				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**No**		**OSPAR (2013)**	**No specific data was located on the degradation rate of sodium carboxymethyl cellulose. It is a cellulose derivative and therefore biodegradation is expected. However information on rates of degradation was not available. Sodium carboxymethyl cellulose has been classified as PLONOR by OSPAR which indicates that it is readily biodegradable as one of the PLONOR criteria is ready biodegradability.**
Bioaccumulation				
Biooncentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No data (See comment)			No specific data was located on the bioaccumulation potential of sodium carboxymethyl cellulose. It has been classified as PLONOR by OSPAR which indicates it would not meet the criteria for bioaccumulation as the PLONOR criteria is BCF <100
Does field data show evidence for biomagnification?				
If answer to either question is YES, substance is bioaccumulative				
If no BCF data, is log Kow ≥ 4.5?	No data (See comment)			No specific data was located on the bioaccumulation potential of sodium carboxymethyl cellulose. It has been classified as PLONOR by OSPAR which indicates it would not meet the criteria for bioaccumulation as the PLONOR criteria is log Kow <3
If answer is YES, substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely?	Not assessed due to the above information			
Substance is chronically non-toxic in mammals				
Molecular size ≥ 4.3nm				
Molecular weight ≥ 1100g/mol				
Octanol solubility ≤ 0.002mmol/l				
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative				
If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**		**OSPAR (2013)**	**No specific data was located on the bioaccumulation potential of sodium carboxymethyl cellulose. It has been classified as PLONOR by OSPAR which indicates it would not meet the criteria for bioaccumulation as the PLONOR criteria is log Kow <3 and BCF <100**
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No		Ecotox	No chronic toxicity data was located for this substance. The limited acute data indicate moderate to low acute toxicity to the species of invertebrate and fish studied with effect concentrations reported as 87mg/l for the invertebrate Ceriodaphnia dubia and >20000mg/l for the fish Carassius carassius. Based on the available data then it is unlikely that it will meet the criteria for chronic toxicity
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		EU CLP database	Sodium carboxymethyl cellulose has not been formally assessed under CLP. Industry data submissions to the CLP database do not indicate that these criteria would be met. Sodium carboxymethyl cellulose is widely used as a thickening agent in a range of products including toothpaste, paints, eye drops etc and also many food products and it is an approved food additive (EFSA). An assessment by the FDA concluded that it was not considered a hazard to the public (FDA, 2015). Weight of evidence indicates does not meet criteria
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		EU CLP database	Sodium carboxymethyl cellulose has not been formally assessed under CLP. Industry data submissions to the CLP database do not indicate that these criteria would be met. Sodium carboxymethyl cellulose is widely used as a thickening agent in a range of products including toothpaste, paints, eye drops etc and also many food products and it is an approved food additive (EFSA). An assessment by the FDA concluded that it was not considered a hazard to the public (FDA, 2015). Weight of evidence indicates does not meet crteria
If answer to any question is YES, substance is toxic				
If answer to all questions is NO, substance is not toxic				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No**			
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	No		OSPAR (2013)	No specific data was located on the degradation rate of sodium carboxymethyl cellulose. It is a cellulose derivative and therefore biodegradation is expected. However information on rates of degradation was not available. Sodium carboxymethyl cellulose has been classified as PLONOR by OSPAR which indicates that it is readily biodegradable as one of the PLONOR criteria is ready biodegradability.
Half life in marine, fresh or estuarine sediment ≥ 180 days				
Half life in soil ≥ 180 days				
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No		OSPAR (2013)	No specific data was located on the bioaccumulation potential of sodium carboxymethyl cellulose. It has been classified as PLONOR by OSPAR which indicates it would not meet the criteria for bioaccumulation as the PLONOR criteria is log Kow <3 and BCF <100
If answer is yes, substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?	Not assessed			
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	**Not assessed**			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		EU CLP database	Sodium carboxymethyl cellulose has not been formally assessed under CLP. Industry data submissions to the CLP database do not indicate that these criteria would be met. Sodium carboxymethyl cellulose is widely used as a thickening agent in a range of products including toothpaste, paints, eye drops etc and also many food products and it is an approved food additive (EFSA). An assessment by the FDA concluded that it was not considered a hazard to the public (FDA, 2015). Weight of evidence indicates it does not meet the criteria
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	**No**			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			**Limited data is available on this substance however the weight of evidence indicates it does not meet the criteria for Hazardous**

equivalent risk phrases: T;R23/24/25. T+;R26/27/28 *(does not include Xn: R20. Xn:R21. Xn:R22)*
* equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 *(does not include R33, R67, Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61 *(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)*

Does substance have breakdown products of concern? No

REFERENCES

ECOTOX https://cfpub.epa.gov/ecotox/report.cfm?type=short
US FDA (2015) http://www.fda.gov/Food/IngredientsPackagingLabeling/GRAS/SCOGS/ucm261244.htm
EFSA (2012) http://onlinelibrary.wiley.com/doi/10.2903/j.efsa.2012.2904/pdf
OSPAR (2016) - PLONOR list https://www.ospar.org/work-areas/oic/chemicals
EU C&L database https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/135577

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SUMMARY: NON-HAZARDOUS	Yes / No / Insuffficent data / Borderline / assume yes or no?	Value	Reference	Comments
				Sodium gluconate (CAS: 527-07-1)
Is substance persistent, bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test	Yes	100% (28days)	SIDS (2004)	Ready biodegradability study reported 100% degradation over 28days.
Passes inherent biodegradation test				
If answer to either question is YES, substance is not persistent				
If answer to both questions is NO, additional data on half life is required				
Half life marine water ≥ 60 days	No data (See comment)			No degradation half life data was located for water, sediment and soil however information is available on a ready biodegradability study (see above)
Half life fresh or estuarine water ≥ 40 days				
Half life marine sediment ≥ 180 days				
Half life fresh or estuarine sediment ≥ 120 days				
Half life in soil ≥ 120 days				
If answer to any question is YES, substance is persistent				
If answer to all questions is NO, substance is not persistent				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**No**			No degradation half life data was located for water, sediment and soil however information is available on a ready biodegradability study which indicates it meets the criteria for ready biodegradability.
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No data (see comment)		SIDS (2004)	No BCF data was located for sodium gluconate. The SIDS report noted that no bioaccumulation effects were expected and the substance has been found to be readily metabolised which would reduce the potential to bioaccumulate.
Does field data show evidence for biomagnification?				
If answer to either question is YES, substance is bioaccumulative				
If no BCF data, is log Kow ≥ 4.5?	No	-5.99	SIDS (2004)	An estimated log Kow of -5.99 was reported for sodium gluconate
If answer is YES, substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely?	Not assessed due to the above data			
Substance is chronically non-toxic in mammals				
Molecular size ≥ 4.3nm				
Molecular weight ≥ 1100g/mol				
Octanol solubility ≤ 0.002mmol/l				
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative				
If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**			Although limited data is available the weight of evidence indicates that sodium gluconate is not expected to meet the criteria for bioaccumulation
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No	560mg/l	SIDS (2004)	Chronic data was limited to two species of algae, ie a 72hr NOEC for Selenastrum capricornutum of 560mg/l and a 72hr NOEC of >100mg/l for the alga Desmodesmus subspicatus. Acute data for Daphnia magna which gave an acute NOEC of >1000mg/l also supports the indication that sodium gluconate is unlikely to meet the criteria for chronic toxicity. Acute study on fish noted an LC0 of >100mg/l.
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		EU C&L database/SIDS(2004)	An EU harmonised C&L classification is not available for sodium gluconate. Industry submissions to the C&L database indicates that it does not meet the criteria for long term toxicity. This is supported by data in the SIDS report which noted that studies on repeated dosing did not indicate significant toxic effects.
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		EU C&L database/SIDS(2004)	An EU harmonised C&L classification is not available for sodium gluconate. Industry submissions to the C&L database indicates that it does not meet the criteria for CMR. This is supported by data in the SIDS report which noted that studies did not indicate it was mutagenic or reproductive toxicity.
If answer to any question is YES, substance is toxic				
If answer to all questions is NO, substance is not toxic				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No**			The available data indicates it does not meet the criteria for toxicity
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	No data (see comment)		SIDS (2004)	No degradation half life data was located for water, sediment and soil however information is available on a ready biodegradability study which indicates it is readily biodegradable (see above)
Half life in marine, fresh or estuarine sediment ≥ 180 days				
Half life in soil ≥ 180 days				
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No data (see comment)		SIDS (2004)	No BCF data was located for sodium gluconate. The SIDS report noted that no bioaccumulation effects were expected and the substance has been found to be readily metabolised which would reduce the potential to bioaccumulate.
If answer is yes, substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?	Not assessed			
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		EU C&L database/SIDS(2004)	An EU harmonised C&L classification is not available for sodium gluconate. Industry submissions to the C&L database indicates that it does not meet the criteria for mutagenicity. This is supported by data in the SIDS report which noted that studies did not indicate it was mutagenic.
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	No			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			**The available data indicate it does not meet the criteria for Hazardous. In addition in support of this sodium gluconate is listed on Annex IV of REACH. These are substances exempted from REACH as they are considered to cause minimum risk because of their intrinsic properties.**
Does substance have known breakdown products of concern?	No			
(Determinations on known key breakdown products will be undertaken if known. It is acknowledged in the methodology that it is not possible to assess every breakdown product)				

equivalent risk phrases: T;R23/24/25, T+;R26/27/28 *(does not include Xn; R20, Xn;R21, Xn;R22)*
* equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 *(does not include R33, R67, Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61
(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)

REFERENCES

OECD SIDS (2004) Gluconic acid and its derivatives http://webnet.oecd.org/Hpv/UI/handler.axd?id=c18390f2-52ca-49d0-bede-668d9778c1ef
OECD SIDS (2004) Gluconic acid and its derivatives http://webnet.oecd.org/Hpv/UI/handler.axd?id=b94cc5f7-de5c-4417-b6c2-f1eb4ffcdb72
EU C&L database https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/9919

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Sodium hydroxide (CAS: 1310-73-2)

SUMMARY: NON-HAZARDOUS	Yes / No / Insufficent data / Borderline / assume yes or no?	Value	Reference	Comments
Is substance persistent, bioaccumulative and toxic?				
Persistence				
Passes ready biodegredation test	See comment			The persistence criteria are not directly applicable to metals/inorganics and were developed principally for organic substances (see comment below)
Passes inherent biodegredation test	See comment			
If answer to either question is YES, substance is not persistent				
If answer to both questions is NO, additional data on half life is required				
Half life marine water ≥ 60 days				The persistence criteria are not directly applicable to metals/inorganics and were developed principally for organic substances (see comment below)
Half life fresh or estuarine water ≥ 40 days	See comment			
Half life marine sediment ≥ 180 days				
Half life fresh or estuarine sediment ≥ 120 days				
Half life in soil ≥ 120 days				
If answer to any question is YES, substance is persistent				
If answer to all questions is NO, substance is not persistent				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**Yes**		**SIDS (2002)**	**The persistence criteria are not directly applicable to metals/inorganics and were developed principally for organic substances.Sodium hydroxide will not degrade but will dissociate in water to sodium and hydroxide ions neither of which will biodegrade. Based on the latter have noted the worst case of persistent**
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	See comment		EU RAR (2007)	BCF studies are not directly relevant to inorganic substances such as sodium hydroxide. No BCF data was available for sodium hydroxide. The EU Risk Assessment report notes that bioaccumulation is not relevant for sodium hydroxide
Does field data show evidence for biomanification?				
If answer to either question is YES. substance is bioaccumulative				
If no BCF data, is log Kow ≥ 4.5?	See comment			Log Kow values are not considered reliable estimates of the bioaccumulation potential of inorganic substances such as sodium hydroxide.
If answer is YES, substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely? Substance is chronically non-toxic in mammals Molecular size ≥ 4.3nm Molecular weight ≥ 1100g/mol Octanol solubility ≤ 0.002mmol/l	Not assessed due to the above information			
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative				
If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**		**SIDS (2002) EU RAR (2007)**	**No specific data was available for BCFs and is not considered relevant for sodium hydroxide. Log Kow values are not considered relevant for inorganic substances. Sodium hydroxide is not considered to bioaccumulate as it will be present in the form of the sodium and hydroxide ions.**
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No	25mg/l	EU RAR (2007)	Very little chronic data was available on sodium hydroxide. The results of a 3 generation study on the guppy indicated no chronic effects at a concentration of 25mg/l. The main potential effects of sodium hydroxide on aquatic life relate to its effect on pH due to the alkaline nature of the hydroxide ion. Acute effects on invertebrates and fish were noted in the range of 20-40mg/l.
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		ECHA C&L database	An EU harmonised C&L classification is available. It indicates sodium hydroxide does not meet these criteria
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		ECHA C&L database	An EU harmonised C&L classification is available. It indicates sodium hydroxide does not meet these criteria
If answer to any question is YES, substance is toxic				
If answer to all questions is NO, substance is not toxic				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No**			
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	Yes		SIDS (2002)	The persistence criteria are not directly applicable to metals/inorganics and were developed principally for organic substances.Sodium hydroxide will not degrade but will dissociate in water to sodium and hydroxide ions neither of which will biodegrade. Based on the latter have noted the worst case of persistent
Half life in marine, fresh or estuarine sediment ≥ 180 days				
Half life in soil ≥ 180 days				
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No		EU RAR (2007)	No BCF data was available for sodium hydroxide however the EU Risk Assessment report notes that bioaccumulation is not relevant for sodium hydroxide
If answer is ves. substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?				
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		ECHA C&L database	An EU harmonised C&L classification is available. It indicates sodium hydroxide does not meet these criteria
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	**No**			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			

equivalent risk phrases: T;R23/24/25, T+;R26/27/28 *(does not include Xn; R20, Xn;R21, Xn;R22)*
* equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 *(does not include R33, R67, Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61 *(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)*

Does substance have breakdown products of concern? No

REFERENCES

ECHA C&L database https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/134413
SIDS (2002) - SIDS initial assessment report - sodium hydroxide http://www.inchem.org/documents/sids/sids/nahydrox.pdf
EU RAR (2007) - EU risk assessment report - sodium hydroxide http://echa.europa.eu/documents/10162/0ded9c53-4082-405b-b09a-e16e57e158af

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SUMMARY: NON-HAZARDOUS	Yes / No / Insufficent data / Borderline / assume yes or no?	Value	Reference	Comments
				Sodium lauryl ether sulphate (CAS: 3088-31-1)
Is substance persistent, bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test	Yes		ECHA CHEM	The limited data available indicates that it is readily biodegradable with 71% degradation noted over 28days.
Passes inherent biodegradation test				
If answer to either question is YES, substance is not persistent				
If answer to both questions is NO, additional data on half life is required				
Half life marine water ≥ 60 days				
Half life fresh or estuarine water ≥ 40 days	No		ECHA CHEM	A degradation half life of 38days is reported for water. This is an estimated rather than measured result.
Half life marine sediment ≥ 180 days				
Half life fresh or estuarine sediment ≥ 120 days				
Half life in soil ≥ 120 days	No		ECHA CHEM	A degradation half life of 75days is reported for soil. This is an estimated rather than measured result.
If answer to any question is YES, substance is persistent				
If answer to all questions is NO, substance is not persistent				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**No**			**Limited data is available on the persistence of sodium lauryl ether sulphate in the aquatic environment. Much of the data is estimated rather than measured. The weight of evidence indicates that it does not meet the criteria for persistence**
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No	71	ECHA CHEM	No measured BCF data were located. An estimated BCF of 71 was noted in ECHA CHEM dossier. It is noted however that there is uncertainty in the assessment of the bioaccumulation of surfactants and therefore degree of uncertainty associated with this result.
Does field data show evidence for biomagnification?				
If answer to either question is YES, substance is bioaccumulative				
If no BCF data, is log Kow ≥ 4.5?	No	-0.6	ECHA CHEM	A log Kow of -0.6 has been estimated however it is noted that determination of log Kow for surfactants is not straight forward and therefore an element of uncertainty associated with this result.
If answer is YES, substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely? Substance is chronically non-toxic in mammals Molecular size ≥ 4.3nm Molecular weight ≥ 1100g/mol Octanol solubility ≤ 0.002mmol/l	Not assessed due to the above			
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative				
If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**			**There is limited data available on the potential for this substance to bioaccumulate. There is uncertainty associated with the data located as it is estimated data and also there is difficulty in interpreting accumulation of surfactants.**
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No		ECHA CHEM/ Caracciolo et al (2017)	Limited data is available on the toxicity of sodium lauryl ether sulphate to aquatic life. No chronic toxicity data was located. Acute data on fish indicated effects in the range of 7.4 - 13.6mg/l, and to invertebrates in the range of 24 - 39mg/l. Algal effects were observed at concentrations as low as 0.5mg/l.
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		ECHA C&L database	An EU harmonised classification is not available for this substance. Industry submissions to the database indicate it does not meet the criteria.
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		ECHA C&L database	An EU harmonised classification is not available for this substance. Industry submissions to the database indicate it does not meet the criteria.
If answer to any question is YES, substance is toxic				
If answer to all questions is NO, substance is not toxic				
Is sufficient data available? (if not assume substance is toxic)				
Is substance toxic?	**No**			
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			**This is based on limited data with much of the data being estimated rather than measured, eg for persistence and bioaccumulation. Based on the weight of evidence and also consideration of data for other anionic surfactants it is not expected to meet the criteria for PBT.**
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	No		ECHA CHEM	A degradation half life of 38days is reported for water. This is an estimated rather than measured result.
Half life in marine, fresh or estuarine sediment ≥ 180 days				
Half life in soil ≥ 180 days				
If answer to any question is YES, substance is very persistent	No		ECHA CHEM	A degradation half life of 75days is reported for soil. This is an estimated rather than measured result.
Is bioconcentration factor ≥ 5000	No	71	ECHA CHEM	No measured BCF data were located. An estimated BCF of 71 was noted in ECHA CHEM dossier. It is noted however that there is uncertainty in the assessment of the bioaccumulation of surfactants and therefore degree of uncertainty associated with this result.
If answer is yes, substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			**This is based on limited data with much of the data being estimated rather than measured, eg for persistence and bioaccumulation. Based on the weight of evidence and also consideration of data for other anionic surfactants it is not expected to meet the criteria for PBT.**
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?	Not assessed			
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		ECHA C&L database	An EU harmonised classification is not available for this substance. Industry submissions to the database indicate it does not meet the criteria.
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	**No**			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			
Does substance have known breakdown products of concern? *(Determinations on known key breakdown products will be undertaken if known. It is acknowledged in the methodology that it is not possible to assess every breakdown product)*	No			

equivalent risk phrases: T;R23/24/25, T+;R26/27/28 *(does not include Xn; R20, Xn;R21, Xn;R22)*
* equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 *(does not include R33, R67, Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61 *(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)*

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ECHA C&L database https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/37428
ECHA -CHEM https://echa.europa.eu/registration-dossier/-/registered-dossier/12097/2/3
HSDB https://toxnet.nlm.nih.gov/cgi-bin/sis/search2/r?dbs+hsdb:@term+@na+DIETHYLENE%20GLYCOL%20MONOLAURYL%20ETHER%20SODIUM%20SULFATE
Caracciolo et al (2017) https://www.researchgate.net/publication/316080385_Characteristics_and_environmental_fate_of_the_anionic_surfactant_sodium_lauryl_ether_sulphate_SLES_used_as_the_main_component_in_foaming_agents_for_mecha

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SUMMARY: NON-HAZARDOUS	Yes / No / Insufficent data / Borderline / assume yes or no?	Value	Reference	Comments
			Sodium nitrite (CAS: 7632-00-0)	
Is substance persistent, bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test	(See comment)			The persistence criteria are not directly applicable to metals/inorganics and were developed principally for organic substances (see comment below)
Passes inherent biodegradation test	(See comment)			
If answer to either question is YES, substance is not persistent				
If answer to both questions is NO, additional data on half life is required				
Half life marine water ≥ 60 days	See comment			The persistence criteria are not directly applicable to metals/inorganics and were developed principally for organic substances (see comment below)
Half life fresh or estuarine water ≥ 40 days	See comment			
Half life marine sediment ≥ 180 days	See comment			
Half life fresh or estuarine sediment ≥ 120 days	See comment			
Half life in soil ≥ 120 days	See comment			
If answer to any question is YES, substance is persistent				
If answer to all questions is NO, substance is not persistent				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**No**			The persistence criteria are not directly applicable to metals/inorganics and were developed principally for organic substances. Metals and inorganics such as sodium nitrite are inherently persistent and subject to transformation rather than degradation. In water sodium nitrite will rapidly dissociate to sodium and nitrite ions. The latter are converted to nitrates in the presence of bacteria in the environment.
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No	3.162	SIDS (2005)	Sodium nitrite is an inorganic compound and therefore the calculation of BCF is not directly relevant. An estimated BCF value is reported in the SIDS assessment and this value is 3.162. The SIDS report notes that fish are known to metabolise sodium nitrite which reduces the opportunity to bioaccumulate.
Does field data show evidence for biomagnification?				
If answer to either question is YES, substance is bioaccumulative				
If no BCF data, is log Kow ≥ 4.5?	No	-3.7	SIDS (2005)	Log Kow values are not considered a reliable assessment of bioaccumulation for inorganic substances. However a log Kow is noted in the SIDS assessment. The value reported indicates that it does not meet the criteria. (Value noted as unreliable in the ECHA CHEM dossier)
If answer is YES, substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely? Substance is chronically non-toxic in mammals Molecular size ≥ 4.3nm Molecular weight ≥ 1100g/mol Octanol solubility ≤ 0.002mmol/l	Not assessed due to the above			
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative				
If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**			
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No		SIDS (2005)	The limited chronic toxicity data located noted chronic NOECs in the range of 1 - 100mg/l. The lowest chronic NOEC was 1mg/l which was a 29d NOEC for Cyprinus carpio. A 31d NOEC for Ictalurus punctatus was 6.616mg/l and for Penaeus monodon an 80d NOEC of 2mg/l was reported. For the alga Desmodesmus subspicatus a 3d NOEC of 100mg/l was noted.
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		ECHA CLP database	A harmonised EU CLP classification indicates sodium nitrite does not meet the criteria.
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		ECHA CLP database	A harmonised EU CLP classification indicates sodium nitrite does not meet the criteria. The SIDS report indicates that there is some evidence of potential mutagenic effects in vitro with some evidence for in vivo effects however CLP classification does not indicate mutagenicity. Sodium nitrite is widely used as a food preservative.
If answer to any question is YES, substance is toxic				
If answer to all questions is NO, substance is not toxic				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No**			
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	(See comment)			The persistence criteria are not directly applicable to metals/inorganics and were developed principally for organic substances. Metals and inorganics such as sodium nitrite are inherently persistent and subject to transformation rather than degradation. In water sodium nitrite will rapidly dissociate to sodium and nitrite ions. The latter are converted to nitrates in the presence of bacteria in the environment.
Half life in marine, fresh or estuarine sediment ≥ 180 days				
Half life in soil ≥ 180 days				
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No	3.162	SIDS (2005)	Sodium nitrite is an inorganic compound and therefore the calculation of BCF is not directly relevant. An estimated BCF value is reported in the SIDS assessment and this value is 3.162. The SIDS report notes that fish are known to metabolise sodium nitrite which reduces the opportunity to bioaccumulate.
If answer is yes, substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?	Not assessed			
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		ECHA CLP database	A harmonised EU CLP classification indicates sodium nitrite does not meet the criteria.
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	**No**			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			
Does substance have known breakdown products of concern? *(Determinations on known key breakdown products will be undertaken if known. It is acknowledged in the methodology that it is not possible to assess every breakdown product)*				

equivalent risk phrases: T:R23/24/25. T+:R26/27/28 *(does not include Xn: R20. Xn:R21. Xn:R22)*
* equivalent risk phrases T:R39/23/24/25. T+:R26/27/28. T:R48/23/24/25 *(does not include R33. R67. Xi: R37. Xn:R4820/21/22. Xn:R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61 *(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)*

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ECHA CLP database https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/62648
SIDS assessment (Sodium nitrite) (2005) http://www.inchem.org/documents/sids/sids/7632000.pdf

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SUMMARY: NON-HAZARDOUS	Sorbitol (CAS: 50-70-4)			
	Yes / No / Insufficent data / Borderline / assume yes or no?	Value	Reference	Comments
Is substance persistent, bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test	No data (see below)			
Passes inherent biodegradation test	No data (see below)			
If answer to either question is YES, substance is not persistent *If answer to both questions is NO, additional data on half life is required*				
Half life marine water ≥ 60 days	No	81% of theorectical BOD in 14days	HSDB	Very little information was located on the fate of sorbitol. A study reported on HSDB indicated 81% of theoretical BOD was observed after 2 weeks in a Japanese MITI test. No degradation half life data was located.
Half life fresh or estuarine water ≥ 40 days Half life marine sediment ≥ 180 days Half life fresh or estuarine sediment ≥ 120 days Half life in soil ≥ 120 days				
If answer to any question is YES. substance is persistent *If answer to all questions is NO, substance is not persistent*				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**No (see comment)**			**Limited data is available on the degradation half lives of sorbitol. One study was located which indicated it did not meet the criteria for persistence.**
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No	1 and 3	HSDB	Estimated BCF values of 1 and 3 are reported on HSDB.
Does field data show evidence for biomagnification?				
If answer to either question is YES. substance is bioaccumulative				
If no BCF data, is log Kow ≥ 4.5?	No	-2.2	HSDB	
If answer is YES, substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely? Substance is chronicallv non-toxic in mammals Molecular size ≥ 4.3nm Molecular weight ≥ 1100g/mol Octanol solubility ≤ 0.002mmol/l	Not assessed due to the above information			
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative *If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained*				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No (see comment)**			**Limited data is available on the potential for soribtol to bioaccumulate. The log Kow and BCF data located indicate it does not meet the criteria.**
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No data (see summary comment)			No aquatic toxicity data was located
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		EU C&L database	A harmonised CLP classification is not available for sorbitol. The industry submissions to the database indicates that it does not meet the criteria
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		EU C&L database	A harmonised CLP classification is not available for sorbitol. The industry submissions to the database indicates that it does not meet the criteria
If answer to any question is YES, substance is toxic *If answer to all questions is NO. substance is not toxic*				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No (see comment)**			Very litle information was located on the toxicity of sorbitol. No aquatic toxicity data was located. Industry submissions to the C&L database indicate it is not of high toxicity to aquatic life. Industry submissions to the CLP database do not indicate it will meet the criteria for human health toxicity.
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			Limited data is available on the persistence, bioaccumulation and toxicity of sorbitol in the aquatic environment. The data located indicates it does not meet the criteria for these properties. The limited data is supported by the following. Sorbitol is one of the substances on Annex IV under REACH which means it is exempt from the need for registration under REACH as it is considered to cause minimum risk due to its intrinsic properties. A SIDS initial assessment report concluded it is considered to be of low priority for further consideration as its intrinsic properties indicate low hazard.
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	No	81% of theorectical BOD in 14days	HSDB	Very little information was located on the fate of sorbitol. A study reported on HSDB indicated 81% of theoretical BOD was observed after 2 weeks in a Japanese MITI test. No degradation half life data was located.
Half life in marine, fresh or estuarine sediment ≥ 180 days Half life in soil ≥ 180 days				
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No	1 and 3	HSDB	The estimated BCF values are much lower than the criteria and therefore indicate it does not meet the criteria for bioaccumulation.
If answer is yes, substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No (see comment)**			Limited data is available on the degradation half lives of sorbitol. One study was located which indicated it did not meet the criteria for persistence. Limited data is available on the potential for soribtol to bioaccumulate. The log Kow and BCF data located indicate it does not meet the criteria.
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?	Not assessed			
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No			A harmonised CLP classification is not available for sorbitol. The industry submissions to the database indicates that it does not meet the criteria
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	No			Very litle information was located on the toxicity of sorbitol. Industry submissions to the CLP database database do not indicate it will meet the criteria for mutagenicity. In addition the weight of evidence that sorbitol is of low hazard suggests it does not meet the criteria for mutagenicity (see comments in final summary section)
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			Limited data is available on the persistence, bioaccumulation and toxicity of sorbitol in the aquatic environment. The data located indicates it does not meet the criteria for these properties. The limited data is supported by the following. Sorbitol is one of the substances on Annex IV under REACH which means it is exempt from the need for registration under REACH as it is considered to cause minimum risk due to its intrinsic properties. A SIDS initial assessment report concluded it is considered to be of low priority for further consideration as its intrinsic properties indicate low hazard.

equivalent risk phrases: T;R23/24/25, T+;R26/27/28 *(does not include Xn; R20, Xn;R21, Xn;R22)*
* equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 *(does not include R33, R67, Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61 *(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)*

Does substance have breakdown products of concern?	No	No

REFERENCES

EU CLP database https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/87746
SIDS (2009) http://webnet.oecd.org/Hpv/UI/handler.axd?id=178e1e24-4eb2-490f-8f54-6f78f41b4239
HSDB https://toxnet.nlm.nih.gov/cgi-bin/sis/search2/r?dbs+hsdb:@term+@rina+D-Sorbitol

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SUMMARY: NON-HAZARDOUS	Sucrose (CAS: 57-50-1)			
	Yes / No / Insufficent data / Borderline / assume yes or no?	Value	Reference	Comments
Is substance persistent, bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test	Yes		EU	Noted to be readily biodegradable based on modelling studies
Passes inherent biodegradation test				
If answer to either question is YES, substance is not persistent				
If answer to both questions is NO, additional data on half life is required				
Half life marine water ≥ 60 days	No data			
Half life fresh or estuarine water ≥ 40 days				
Half life marine sediment ≥ 180 days				
Half life fresh or estuarine sediment ≥ 120 days				
Half life in soil ≥ 120 days				
If answer to any question is YES, substance is persistent				
If answer to all questions is NO, substance is not persistent				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**No (see concluding comments)**			**Limited data indicates it is readily biodegradable. (See concluding comments for further information on weight of evidence)**
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No	3.162	EU	An estimated BCF value of 3.162 indicates it does not meet the criteria
Does field data show evidence for biomagnification?				
If answer to either question is YES, substance is bioaccumulative				
If no BCF data, is log Kow ≥ 4.5?	No	-3.7	HSDB	The reported log Kow for sucrose indicates that it does not meet the criteria
If answer is YES, substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely? Substance is chronically non-toxic in mammals Molecular size ≥ 4.3nm Molecular weight ≥ 1100g/mol Octanol solubility ≤ 0.002mmol/l	Not considered due to the above information			
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative				
If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No (see concluding comments)**			**Limited data indicates it does not bioaccumulate (See concluding comments for further information on weight of evidence)**
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No	456000mg/l	EU	Limited aquatic toxicity data was located for sucrose. A predicted chronic endpoint of 456000mg/l was estimated for a 16d Daphnia magna study. A 30d fish predicted endpoint of 932000mg/l also indicated that sucrose did not meet the criteria for chronic aquatic toxicity.
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		ECHA C&L database	An EU harmonised C&L classification is not available for sucrose. The industry submissions to the C&L database do not indicate that it meets the criteria. Sucrose is widely consumed in food products and is a component of many medicines
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		ECHA C&L database	An EU harmonised C&L classification is not available for sucrose. The industry submissions to the C&L database do not indicate that it meets the criteria. Sucrose is widely consumed in food products and is a component of various medicines. Available data in HSDB indicate it did not meet the criteria for carcinogenicity and mutagenicity
If answer to any question is YES, substance is toxic				
If answer to all questions is NO, substance is not toxic				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No (see concluding comments)**			**Limited data indicates it does not meet the criteria for toxicity (See concluding comments for further information on weight of evidence)**
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			Limited data is available to assess sucrose against the specified criteria. Sucrose however is listed on Annex IV of REACH. These are substances exempted from REACH as they are considered to cause minimum risk because of their intrinsic properties. In addition a SIDS assessment on sucrose concluded that it is of low priority due to its intrinsic properties indicating low hazard. The weight of evidence therefore indicates that it would not be determined as Hazardous.
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	No		EU	The limited data available indicated ready biodegradability based on modelling
Half life in marine, fresh or estuarine sediment ≥ 180 days				
Half life in soil ≥ 180 days				
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No	3.162	EU	An estimated BCF value of 3.162 indicates it does not meet the criteria
If answer is yes, substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No (see concluding comments)**			**The limited data indicates it does not meet the criteria for vPvB (See concluding comments for further information on weight of evidence)**
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?				
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		ECHA C&L database	An EU harmonised C&L classification is not available for sucrose. The industry submissions to the C&L database do not indicate that it meets the criteria. Sucrose is widely consumed in food products.
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	**No (see concluding comments)**			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			**Limited data is available to assess sucrose against the specified criteria. Sucrose however is listed on Annex IV of REACH. These are substances exempted from REACH as they are considered to cause minimum risk because of their intrinsic properties. In addition a SIDS assessment on sucrose concluded that it is of low priority due to its intrinsic properties indicating low hazard. The weight of evidence therefore indicates that it would not be determined as Hazardous.**

equivalent risk phrases: T;R23/24/25, T+;R26/27/28 *(does not include Xn; R20, Xn;R21, Xn;R22)*
* equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 *(does not include R33, R67, Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61 *(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)*

Does substance have breakdown products of concern? No

REFERENCES

ECHA C&L database http://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/42557
EU (Evaluation of existing entries Annex IV) http://ec.europa.eu/environment/chemicals/reach/pdf/6b_appendix_2.pdf
HSDB http://toxnet.nlm.nih.gov/cgi-bin/sis/search2/r?dbs+hsdb:@term+@na+SUCROSE
SIDS (2009) http://webnet.oecd.org/Hpv/UI/handler.axd?id=e43ab242-6e55-4bad-8af5-ad67b0afa0f2

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SUMMARY: NON-HAZARDOUS	Tetraethylene glycol (CAS: 112-60-7)			
	Yes / No / Insufficent data / Borderline / assume yes or no?	Value	Reference	Comments
Is substance persistent, bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test				
Passes inherent biodegradation test	Yes		SIDS	The SIDS report noted two studies which indicated inherent biodegradation with 22% reported after 20days in one study and 40% after 28days in another
If answer to either question is YES, substance is not persistent				
If answer to both questions is NO, additional data on half life is required				
Half life marine water ≥ 60 days				
Half life fresh or estuarine water ≥ 40 days	No		SIDS	No specific degradation half life data was located. As noted above the SIDS report noted two studies which indicated inherent biodegradation with 22% reported after 20days in one study and 40% after 28days in another
Half life marine sediment ≥ 180 days				
Half life fresh or estuarine sediment ≥ 120 days				
Half life in soil ≥ 120 days				
If answer to any question is YES, substance is persistent				
If answer to all questions is NO, substance is not persistent				
Is sufficient data available? (if not assume substance is persistent)				
Is substance persistent?	**No**		**SIDS**	**Limited data was located on the degradation of tetraethylene glycol with no half life data being located. The data available indicated inherent biodegradation. The fact it does not meet the criteria for persistence is supported by data for other similar glycol compounds, eg triethylene glycol (SIDS).**
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No	3.2	SIDS	A calculated BCF of 3.2 was reported
Does field data show evidence for biomagnification?				
If answer to either question is YES, substance is bioaccumulative				
If no BCF data, is log Kow ≥ 4.5?	No	-2	SIDS	An estimated log Kow of -2 was reported
If answer is YES, substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely?	Not assessed due to the above data			
Substance is chronically non-toxic in mammals				
Molecular size ≥ 4.3nm				
Molecular weight ≥ 1100g/mol				
Octanol solubility ≤ 0.002mmol/l				
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative				
If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**			
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No	>1000mg/l	SIDS	No specific chronic toxicity data was noted in the SIDS report for tetraethylene glycol. Acute data indicated low acute toxicity to the species of algae, invertebrate and fish studied with effect concentrations noted in the range of 7800 - >10000mg/l. Chronic data was located for a similar substance, ie triethlyene glycol. A 28d NOEC of >1000mg/l was reported for the invertebrate Mysidopsis bahia along with a 28d NOEC of >10000mg/l for the fish Menidia peninsulae. Based on this data and the acute toxicity data for tetraethylene glycol indicate this substance does not meet the criteria for chronic toxicity.
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		SIDS/ECHA CHEM	An EU harmonised C&L classification is not available for this substance. Industry submissions to the C&L database indicate that it does not meet the criteria. Data in the SIDS assessment indicates it does not meet the criteria for long term toxicity
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		SIDS/ECHA CHEM	An EU harmonised C&L classification is not available for this substance. Industry submissions to the C&L database indicate that it does not meet the criteria. Data in the SIDS assessment indicates it does not meet the criteria for carcinogenicity, mutagenicity and reproductive toxicity.
If answer to any question is YES, substance is toxic				
If answer to all questions is NO, substance is not toxic				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No**			
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	No		SIDS	Limited data was located on the degradation of tetraethylene glycol with no half life data being located. The data available indicated inherent biodegradation. The fact it does not meet the criteria for persistence is supported by data for other similar glycol compounds, eg triethylene glycol (SIDS).
Half life in marine, fresh or estuarine sediment ≥ 180 days				
Half life in soil ≥ 180 days				
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No	3.2	SIDS	A calculated BCF of 3.2 was reported
If answer is yes, substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?	Not assessed			
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		SIDS/ECHA CHEM	An EU harmonised C&L classification is not available for this substance. Industry submissions to the C&L database indicate that it does not meet the criteria. Data in the SIDS assessment indicates it does not meet the criteria for mutagenicity.
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	**No**			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			
Does substance have known breakdown products of concern? *(Determinations on known key breakdown products will be undertaken if known. It is acknowledged in the methodology that it is not possible to assess every breakdown product)*	No			

equivalent risk phrases: T;R23/24/25, T+;R26/27/28 *(does not include Xn; R20, Xn;R21, Xn;R22)*
* equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 *(does not include R33, R67, Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61 *(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)*

REFERENCES

OECD SIDS (2004) http://webnet.oecd.org/Hpv/UI/handler.axd?id=89f77924-d5bb-4bae-8fa2-2efeec9ee486
ECHA C&L database https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/1816
ECHA-CHEM https://echa.europa.eu/registration-dossier/-/registered-dossier/5383/1

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SUMMARY: NON-HAZARDOUS	Yes / No / Insufficent data / Borderline / assume yes or no?	Value	Reference	Comments
			Tetrapotassium ethylenediamine tetraacetate (CAS: 5964-35-2)	
Is substance persistent, bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test	No		EU ESR (2004)	No specific data was available for tetrapotassium ethylenediamine tetraacetate. Data was available for tetrasodium ethylenediamine tetracetate. This is a very similar substance and therefore the data is considered as relevant. Data for tetrasodium ethylenediamine indicates it is not readily biodegraded with degradation of 0-10% being reported.
Passes inherent biodegradation test				
If answer to either question is YES, substance is not persistent				
If answer to both questions is NO, additional data on half life is required				
Half life marine water ≥ 60 days	No data (see comment)		EU ESR (2004)	No specific information was available on tetrapotassium ethylenediamine tetracetate. Data for tetrasodium ethylenediamine tetracetate was therefore used to assess the potassium form.. An EU risk assessment was undertaken for the sodium based substance. No half life data was reported for tetrasodium ethylenediamine tetraacetate. Predicted half life data for water was noted to be for the iron complex and to be based on data for photolysis. These half lives were noted to be in the order of 20days. However it is noted not all forms will undergo photolysis with some being stable. The predicted half lives for sediment were noted as 200-300days. In the absence of data it is therefore proposed that EDTA would meet the criteria for persistence.
Half life fresh or estuarine water ≥ 40 days				
Half life marine sediment ≥ 180 days				
Half life fresh or estuarine sediment ≥ 120 days				
Half life in soil ≥ 120 days				
If answer to any question is YES, substance is persistent				
If answer to all questions is NO, substance is not persistent				
Is sufficient data available? (if not assume substance is persistent)	Yes			
Is substance persistent?	**Yes**			
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No	1.8	EU ESR (2004)	No data was located for tetrapotassium ethylenediamine tetracetate however data was available for the sodium form. Two BCF values were located. One reported at BCF of 1.8 and the other 1.1 for the fish Lepomis macrochirus
Does field data show evidence for biomagnification?				
If answer to either question is YES, substance is bioaccumulative				
If no BCF data, is log Kow ≥ 4.5?	No data located			
If answer is YES, substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely? Substance is chronically non-toxic in mammals Molecular size ≥ 4.3nm Molecular weight ≥ 1100g/mol Octanol solubility ≤ 0.002mmol/l	Not considered due to the above information			
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative				
If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**			
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No	25mg/l	ECHA CHEM	No specific data was available for tetrapotassium ethylenediamine tetracetate. Available data for the sodium compound. A 21d NOEC of 25mg/l was reported for the invertebrate Daphnia magna. Chronic data was also available for algae and fish with a 3d NOEC of 79mg/l reported for the alga Pseudokirchneriella subcapitata and a NOEC of >37mg/l reported for the fish Danio rerio. This chronic data indicates the criteria is not met.
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		ECHA CLP database	An EU harmonised CLP classification is not available for this substance. Industry submissions to the database indicate that it does not meet the criteria. An EU harmonised C&L classification is available for tetrasodium ethylenediamine tetraacetate which indicates it does not meet the criteria for long term toxicity
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		ECHA CLP database	An EU harmonised CLP classification is not available for this substance. Industry submissions to the database indicate that it does not meet the criteria. An EU harmonised C&L classification is available for tetrasodium ethylenediamine tetraacetate which indicates it does not meet the criteria for CMR
If answer to any question is YES, substance is toxic				
If answer to all questions is NO, substance is not toxic				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No**			
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	No data (see comment)		ESR	No specific information was available on tetrapotassium ethylenediamine tetracetate. However data was available for the similar substance tetrasodium ethylenediamine tetracetate and therefore this has been used to assess the potassium form.. No half life data was reported. However results reported in ECHA-CHEM noted a range of degradation rates with some indicating 0-10% degradation over 70days. In addition in the ESR the degradation rate noted to be used in modelling was noted to be infinity. Although the degradation data reports a range of degradation rates the weight of evidence indicates that it may meet the criteria for persistence and has therefore been noted as persistent for this assessment
Half life in marine, fresh or estuarine sediment ≥ 180 days				
Half life in soil ≥ 180 days				
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No	1.8	ECHA-CHEM, ESR	No data was located for tetrapotassium ethylenediamine tetracetate however data was available for the sodium form. Two BCF values were located. One reported at BCF of 1.8 and the other 1.1
If answer is yes, substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?	Not assessed			
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		ECHA CLP database	An EU harmonised CLP classification is not available for this substance. Industry submissions to the database indicate that it does not meet the criteria. An EU harmonised C&L classification is available for tetrasodium ethylenediamine tetraacetate which indicates it does not meet these criteria
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	No			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			**No specific information was located for tetrapotassium ethylenediamine tetraacetate. However data was available for the sodium form and it is considered a similar compound and therefore the data can be used to undertake the assessment for the potassium form. The data indicates it does not meet the criteria.**
Does substance have known breakdown products of concern? *(Determinations on known key breakdown products will be undertaken if known. It is acknowledged in the methodology that it is not possible to assess every breakdown product)*	No			

equivalent risk phrases: T;R23/24/25, T+;R26/27/28 *(does not include Xn; R20, Xn;R21, Xn;R22)*
* equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 *(does not include R33, R67, Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61 *(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)*

REFERENCES

ECHA CLP database https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/19430
EU ESR (2004) http://echa.europa.eu/documents/10162/415c121b-12cd-40a2-bd56-812c57c303ce

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SUMMARY: NON-HAZARDOUS	Yes / No / Insuffcient data / Borderline / assume yes or no?	Value	Reference	Tetrasodium ethylenediamine tetraacetate (CAS: 64-02-8) Comments
Is substance persistent, bioaccumulative and toxic?				
Persistence				
Passes ready biodegradation test	No		EU ESR (2004)	The available data reported that tetrasodium ethylenediamine tetraacetate is not readily biodegraded with degradation of 0-10% being reported
Passes inherent biodegradation test				
If answer to either question is YES, substance is not persistent				
If answer to both questions is NO, additional data on half life is required				
Half life marine water ≥ 60 days	No data		EU ESR (2004)	Degradation half life data for water was not available. Predictions have been made as part of the risk assessment. The predicted half life data for water was noted to be for the iron complex and to be based on data for photolysis. These half lives were not to be in the order of 20days. However it is noted not all forms will undergo photolysis with some being stable. The predicted half lives for sediment were noted as 200-300days. In the absence of data it is therefore proposed that EDTA would meet the criteria for persistence.
Half life fresh or estuarine water ≥ 40 days				
Half life marine sediment ≥ 180 days				
Half life fresh or estuarine sediment ≥ 120 days				
Half life in soil ≥ 120 days				
If answer to any question is YES, substance is persistent				
If answer to all questions is NO, substance is not persistent				
Is sufficient data available? (if not assume substance is persistent)				
Is substance persistent?	**Yes**			
Bioaccumulation				
Bioconcentration factor (BCF) for aquatic species (wet weight) ≥ 2000	No	1.8	EU ESR (2004)	Two BCF values were located. One reported at BCF of 1.8 and the other 1.1 - both for the fish Lepomis macrochirus
Does field data show evidence for biomagnification?				
If answer to either question is YES, substance is bioaccumulative				
If no BCF data, is log Kow ≥ 4.5?	No data located			
If answer is YES, substance is bioaccumulative				
Does the weight of evidence from the following criteria indicate bioaccumulation unlikely?	Not considered due to the above information			
Substance is chronically non-toxic in mammals				
Molecular size ≥ 4.3nm				
Molecular weight ≥ 1100g/mol				
Octanol solubility ≤ 0.002mmol/l				
If weight of evidence indicates bioaccumulation unlikely (i.e. YES answers) substance is not bioaccumulative				
If weight of evidence indicates bioaccumulation a possibility (i.e. NO answers), BCF data should be obtained				
Is sufficient data available? (if not assume substance bioaccumulates)	Yes			
Is substance bioaccumulative?	**No**			
Toxicity				
Is the lowest chronic NOEC for freshwater or marine organisms ≤ 0.01mg/l	No	25mg/l	EU ESR (2004)	A 21d NOEC of 25mg/l was reported for the invertebrate Daphnia magna. Chronic data was also available for algae and fish with a 3d NOEC of 79mg/l reported for the alga Pseudokirchneriella subcapitata and a NOEC of >37mg/l reported for the fish Danio rerio. This chronic data indicates the criteria is not met.
Is there substantial evidence of long term toxicity (STOT RE1 or STOT RE2)	No		ECHA C&L database	An EU harmonised C&L classification is available which indicates it does not meet the criteria for long term toxicity
Is substance carcinogenic (Carc 1A,1B), mutagenic (Muta 1A, 1B) or toxic for reproduction (Repr 1A, 1B, 2)	No		ECHA C&L database	An EU harmonised C&L classification is available which indicates it does not meet these criteria
If answer to any question is YES, substance is toxic				
If answer to all questions is NO, substance is not toxic				
Is sufficient data available? (if not assume substance is toxic)	Yes			
Is substance toxic?	**No**			
IS SUBSTANCE PERSISTENT, BIOACCUMULATIVE AND TOXIC?	**No**			
Does substance pose an equivalent level of concern?				
Very persistent and very bioaccumulative?				
Half life in marine, fresh or estuarine water ≥ 60 days	No		EU ESR (2004)	Degradation half life data for water was not available. Predictions have been made as part of the risk assessment. The predicted half life data for water was noted to be for the iron complex and to be based on data for photolysis. These half lives were not to be in the order of 20ys. However it is noted not all forms will undergo photolysis with some being stable. The predicted half lives for sediment were noted as 200-300days. In the absence of data it is therefore proposed that EDTA would meet the criteria for persistence.
Half life in marine, fresh or estuarine sediment ≥ 180 days				
Half life in soil ≥ 180 days				
If answer to any question is YES, substance is very persistent				
Is bioconcentration factor ≥ 5000	No	1.8	EU ESR (2004)	Two BCF values were located. One reported at BCF of 1.8 and the other 1.1
If answer is yes, substance is very bioaccumulative				
Is substance very persistent and very bioaccumulative?	**No**			
Does substance pose a specific risk to groundwater?				
Does groundwater monitoring data show half life in groundwater ≥ 1 year	Not assessed			
Do ≥ 5% of groundwater samples show levels of the substance greater than the LOQ?	Not assessed			
Do ≥ 15% of sites have at least one sample where the substance is detected above the LOQ?	Not assessed			
If answer to any question is YES, substance is persistent in groundwater				
Is substance persistent in groundwater?				
If substance is persistent in groundwater, bioaccumulative AND toxic, substance is hazardous				
Does substance pose a specific risk to groundwater?	Not assessed			
Is substance very toxic?				
Is substance mutagenic (Muta 1A, 1B,2) or have no determinable threshold for adverse effects on human health	No		ECHA C&L database	An EU harmonised C&L classification is available which indicates it does not meet these criteria
If answer to any question is YES, substance is very toxic and hazardous				
Is sufficient data available? (if not assume substance is very toxic)	Yes			
Is substance very toxic?	No			
Is substance hazardous to groundwater?				
Is substance hazardous, if so, state on what basis	**No**			

equivalent risk phrases: T;R23/24/25, T+;R26/27/28 *(does not include Xn; R20, Xn;R21, Xn;R22)*
* equivalent risk phrases T;R39/23/24/25, T+;R26/27/28, T;R48/23/24/25 *(does not include R33, R67, Xi; R37, Xn;R4820/21/22, Xn;R68/20/21/22)*
^ equivalent risk phrases carcinogenic Carc. Cat. 1, Carc. Cat. 2, T;R45, T;R49, mutagenic Muta. Cat. 1, Muta. Cat. 2, Muta. Cat. 3, T;R46, T;R68, toxic for reproduction Repr. Cat. 1, Repr. Cat. 2., R60 , R61 *(does not include Carc. Cat. 3, Xn;R40, Repr. Cat. 3, Xn;R62, Xn;R63)*

Does substance have breakdown products of concern? No

REFERENCES

ECHA C&L database http://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/34499
ECHA-CHEM http://echa.europa.eu/registration-dossier/-/registered-dossier/15231
EU ESR (2004) http://echa.europa.eu/documents/10162/415c121b-12cd-40a2-bd56-812c57c303ce
OECD SIDS (2004) http://webnet.oecd.org/Hpv/UI/handler.axd?id=ba21a7be-abf5-4d11-a58b-ebb9687cf75d

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