Committee for Risk Assessment

RAC

Annex 2

Response to comments document (RCOM)

to the Opinion proposing harmonised classification and labelling at EU level of

1,1',1''-nitrilotripropan-2-ol (TIPA)

EC Number: 204-528-4

CAS Number: 122-20-3

ECHA/RAC/CLH-O-0000002510-87-01/A2

Adopted

8 March 2012

ANNEX 2.1: COMMENTS AND RESPONSE TO COMMENTS ON CLH: PROPOSAL AND JUSTIFICATION

[ECHA has compiled the comments received via internet that refer to several hazard classes and entered them under each of the relevant categories/headings as comprehensive as possible. Please note that some of the comments might occur under several headings when splitting the given information is not reasonable.]

Substance name: 1,1',1''-nitrilotripropan-2-ol (TIPA)
CAS number: 122-20-3
EC number: 204-528-4

General comments

Date	Country / Person / Organisation / MSCA	Comment	MSCA Response to comment	RAC response to comment
17/11/2011	France / MSCA	The conclusion differs from the one who had been adopted by the TC C&L committee not because new data are brought but because the use of the results of the study (EU Method C.3 Algal Inhibition test / Desmodesmus subspicatus; Reliability 1; Huels AG, 1997) is different: the 72h-ErC50 (= 710 mg/L based on the growth rate) is now used instead of the 72h-EbC50 (= 50 mg/L based on the number of cells). This approach is logical on a scientific point of view and is in compliance with the technical guidance R.7b (ECHA, May 2008, version 1.1; section R.7.8.4). We can consider the nominal concentrations as acceptable because solubility is high and adsorption potential low; the 72h-ErC50 =710 mg/L value can be thus considered as reliable for concluding no aquatic toxicity classification. In addition, we can note a second study in the same species (BASF AG, 1989, ECT – Oekotoxikologie GmbH 2008; reliability 2) and for which the ecotoxicological values follow the same trend. Besides, the ecotoxicity is even weaker in fish and Daphnia. All the data so clearly indicates that the threshold of 100 mg / L is not reached and thus that the aquatic toxicity classification is not required. Please find hereafter some minor comments.	noted	Rapporteur agrees with this explanation, E_bC_{50} result based on biomass should not be applied as criterion. The recalculated ErC50 value from original measured data are acceptable, according to the mentioned guideline. E_rC_{50} is greater than 100 mg/L.

Carcinogenicity

Date	Country / Person / Organisation / MSCA	Comment	MSCA Response to comment	RAC response to comment

Mutagenicity

Date	Country/ Person/ Organisation/ MSCA	Comment	MSCA Response to comment	RAC response to comment

Toxicity to reproduction

/Date	Country / Person / Organisation / MSCA	Comment	MSCA Response to comment	RAC response to comment

Respiratory sensitisation

Date	Country / Person / Organisation / MSCA	Comment	MSCA Response to comment	RAC response to comment

Other hazards and endpoints

Date	Country / Person / Organisation / MSCA	Comment	MSCA Response to comment	RAC response to comment
10/11/2011	Belgium / Els Boel / MSCA	environment Based on the results of the aquatic toxicity tests (EC50 for all trophic levels >100mg/l) it is warranted, following the classification criteria of the 2nd ATP, to declassify the substance for the environment. Furthermore, the substance shows no potential to bioaccumulate (BCF <500), Based on the classification and labelling criteria in accordance with dir. 67/548/EEC, 1,1',1''-nitrilopropan-2-ol should NOT be classified as R52/53 In conclusion : we agree with the proposed declassification for the environment. Some editorial or/and minor comments: * The comparison table (table 25) which compares the results of the relevant endpoints with the CLP criteria is much appreciated. 5.1. Degradation Table 21, p.17 : typo : OECD 301 A : 15% DOC removal at 28days, should be 18% DOC removal at 28days	Noted Noted Noted Noted typo corrected	Noted Noted Noted Noted

Date	Country / Person / Organisation / MSCA	Comment	MSCA Response to comment	RAC response to comment
14/11/2011	Ireland / Health & Safety Authority / MSCA	Environment: The Irish CA agrees with the removal of the R52/53; Aquatic Chronic 3 (H412) classification.	Noted	Noted.
17/11/2011	Sweden / Erika Witasp Henriksson / MSCA	Environmental classification: According to the information in section 2.1 the substance was classified R50-53 based on the EbC50 for algae < 100 mg/L (substance is also regarded as not bioaccumulative and not readily biodegradable). There is however no reference of this study in the dossier. In order to assess whether the environmental classification of the substance should be deleted it is necessary to know the basis for the original classification. In this case it would be important to know not only value for the EbC50 measured in this study (on which the classification was based) but also whether the ErC50 value in the study was above 100 mg/L. This is unclear, as the study decisive for the R52-53 classification was not referenced, whether this very study is included in the data set presented in the dossier. If it is included the classification of the substance for aquatic hazard according to CLP (and also DSD) is not necessary. However, if the study is not included the rationale for declassification of the substance is insufficient.	The original classification was based on two algae studies (Huels AG, 1997c; BASF AG, 1989) which are included in the dossier. Both studies determined E_rC_{50} values > 100 mg/L and E_bC_{50} values < 100 mg/L.	Noted
17/11/2011	France / MSCA	Environmental hazards: Page 8, section A.2.2: The reason of the modification of this classification lies only in the use of ErC50 instead of l'EbC50: It is thus suited to underline this point from the beginning of this section by specifying the reference in the REACH guidance document R7b (ECHA, 2008, Guidance document R7b, section R.7.8.4, page 23, "Often both acute growth rate EC50 (ErC50) and biomass (EbC50) endpoints are reported however the latter should not be used. The reason is that direct use of the biomass concentration without logarithmic transformation cannot be applied to an analysis of results from a system in exponential growth"). Page 8, section A.2.2, 1st paragraph: "In addition, the water solubility of the substance is high (830 g/L)". We do not see in what this property is an argument. We suggest or to remove this sentence or to explain the link with the low ecotoxicity. Page 8 section A.2.2, 1st paragraph: "The experimentally determined BCF was < 1". This is based on a OECD TG 305 C test, so please provide this precision here. Page 8, section A.2.2, 2nd paragraph: In this paragraph is discussed the absence of rapidly degradability (notably referring to the results of the ready biodegradability tests OCDE 301F and 301A), whereas in the first paragraph it is only discussed the ecotox	Statement added Sentence removed	Noted Noted It is worth to specify the test-method. It is worth to add

Date	Country / Person / Organisation / MSCA	Comment	MSCA Response to comment	RAC response to comment
		and the bioaccumulation + the no-classification conclusion. It seems more appropriated to discuss firstly the 3 classification criteria (ecotox / biodegradability / bioaccumulation) and only after that to conclude the no-classification.	Biodegradability statement added	biodegradability result.
		Page 10, section A.3: Set apart the first paragraph, all the paragraphs are copies of those of the section 2.2. This section treats justifications that classification is needed at the community level. The argument to be moved forward is only that the substance is already classified and that it is a question of revising this classification; so all other paragraphs copied from the section 2.2 should be removed.	Paragraphs removed	Noted
		Page 13, section B.1.2.1: "Information on the test material used is given in chapter 5 of this dossier and is reported in the IUCLID 5 dossier". It should be specified here if the impurities raise a problem or not.	Statement added	Noted
		Page 13, tableau 13: It is impossible to build an opinion about the mentioned values if the used methods are not indicated. In particular the "expert judgement" for surface tension and the "measured" for the Kow should be a little explained. Elsewhere, the Koc is an important value in this dossier and should thus appear in this dossier, ideally with the final value or range of values used and with a reference to table 22 where this property is discussed in details.	Methods and waiving arguments addressed where possible Log Koc range added and referenced to table 22	Table 9.
		Page 15, section B.2.1: replace "distillation" by "distillation".	Typo corrected	destillation to distillation!
		Page 23, table 24 & through the document: Precise that reliability is estimated by using a "Klimisch score".	All available studies and literature data were assessed based on the publication of Klimisch et al. (1997). Where studies are listed in tables the assigned Klimisch code/reliability and a short rationale is stated in the first column.	Noted

ATTACHMENT: CLH report version n. 3 16/12/2011, resubmitted after the public consultation

ANNEX2.2: THE REPORT BELOW IS A REVISION OF THE ORIGINAL CLH REPORT THAT WAS PERFORMED BY THE DOSSIER SUBMITTER AS PART OF THE RESPONSE TO COMMENTS RECEIVED UNDER PUBLIC CONSULTATION.

CLH report

Proposal for Harmonised Classification and Labelling

Based on Regulation (EC) No 1272/2008 (CLP Regulation),

Annex VI, Part 2

Substance Name: 1,1',1''-nitrilotripropan-2-ol

EC Number: 204-528-4

CAS Number: 122-20-3

Index Number: 603-097-00-3

Contact details for dossier submitter:

Federal Institute for Occupational Safety and Health (BAuA)
Federal Office for Chemicals
Friedrich-Henkel-Weg 1 – 25
44149 Dortmund
ChemG@baua.bund.de

Version number: 03 **Date: 16.12.2011**

CONTENTS

Part A.

Part B.

Part A.

1 PROPOSAL FOR HARMONISED CLASSIFICATION AND LABELLING

1.1 Substance

Table 1: Substance identity

Substance name:	1,1',1"-nitrilotripropan-2-ol
EC number:	204-528-4
CAS number:	122-20-3
Annex VI Index number:	603-097-00-3
Degree of purity:	See IUCLID file and confidential Annex
Impurities:	See IUCLID file and confidential Annex

1.2 Harmonised classification and labelling proposal

Table 2: The current Annex VI entry and the proposed harmonised classification

	CLP Regulation	**Directive 67/548/EEC (Dangerous Substances Directive; DSD)**
Current entry in Annex VI, CLP Regulation	Eye Irrit. 2 (H 319) Aquatic Chronic 3 (H 412)	Xi; R36, R52/53
Current proposal for consideration by RAC	Eye Irrit. 2 (H 319) Not classified for Aquatic Chronic 3	Xi; R36 Not classified for R52/53
Resulting harmonised classification (future entry in Annex VI, CLP Regulation)	Eye Irrit. 2 (H 319)	Xi; R36

1.3 Proposed harmonised classification and labelling based on CLP Regulation and/or DSD criteria

Table 3: Proposed classification according to the CLP Regulation

CLP Annex I ref	Hazard class	Proposed classification	Proposed SCLs and/or M-factors	Current classification [1)]	Reason for no classification [2)]
2.1.	Explosives				Conclusive but not sufficient for classification
2.2.	Flammable gases				Conclusive but not sufficient for classification
2.3.	Flammable aerosols				Conclusive but not sufficient for classification
2.4.	Oxidising gases				Conclusive but not sufficient for classification
2.5.	Gases under pressure				Conclusive but not sufficient for classification
2.6.	Flammable liquids				Conclusive but not sufficient for classification
2.7.	Flammable solids				Conclusive but not sufficient for classification
2.8.	Self-reactive substances and mixtures				Conclusive but not sufficient for classification
2.9.	Pyrophoric liquids				Conclusive but not sufficient for classification
2.10.	Pyrophoric solids				Conclusive but not sufficient for classification
2.11.	Self-heating substances and mixtures				Conclusive but not sufficient for classification
2.12.	Substances and mixtures which in contact with water emit flammable gases				Conclusive but not sufficient for classification
2.13.	Oxidising liquids				Conclusive but not sufficient for classification
2.14.	Oxidising solids				Conclusive but not sufficient for classification
2.15.	Organic peroxides				Conclusive but not sufficient for classification
2.16.	Substance and mixtures corrosive to metals				Conclusive but not sufficient for classification
3.1.	Acute toxicity - oral				Conclusive but not sufficient for classification
	Acute toxicity - dermal				Conclusive but not sufficient for classification
	Acute toxicity - inhalation				Conclusive but not sufficient for classification
3.2.	Skin corrosion / irritation				Conclusive but not sufficient for classification
3.3.	Serious eye damage / eye irritation	Eye irritant 2	none	Eye irritant 2	
3.4.	Respiratory sensitisation				Conclusive but not sufficient for classification

CLP Annex I ref	Hazard class	Proposed classification	Proposed SCLs and/or M-factors	Current classification [1)]	Reason for no classification [2)]
3.4.	Skin sensitisation				Conclusive but not sufficient for classification
3.5.	Germ cell mutagenicity				Conclusive but not sufficient for classification
3.6.	Carcinogenicity				Conclusive but not sufficient for classification
3.7.	- Reproductive toxicity - Reproductive toxicity – Effects on or via lactation				Conclusive but not sufficient for classification Conclusive but not sufficient for classification
3.8.	Specific target organ toxicity –single exposure				Conclusive but not sufficient for classification
3.9.	Specific target organ toxicity – repeated exposure				Conclusive but not sufficient for classification
3.10.	Aspiration hazard				Conclusive but not sufficient for classification
4.1.	Hazardous to the aquatic environment	Not classified	none	Aquatic Chronic 3	Conclusive but not sufficient for classification
5.1.	Hazardous to the ozone layer				Conclusive but not sufficient for classification

[1)] Including specific concentration limits (SCLs) and M-factors
[2)] Data lacking, inconclusive, or conclusive but not sufficient for classification

Labelling: Signal word: Warning
Hazard statements: H319: causes serious eye irritation
Precautionary statements:

Proposed notes assigned to an entry:

-.-

Table 4: Proposed classification according to DSD

Hazardous property	Proposed classification	Proposed SCLs	Current classification [1)]	Reason for no classification [2)]
Explosiveness				Conclusive but not sufficient for classification
Oxidising properties				Conclusive but not sufficient for classification
Flammability				Conclusive but not sufficient for classification
Other physico-chemical properties *[Add rows when relevant]*				n.d.
Thermal stability				Conclusive but not sufficient for classification
Acute toxicity				Conclusive but not sufficient for classification
Acute toxicity – irreversible damage after single exposure				Conclusive but not sufficient for classification
Repeated dose toxicity				Conclusive but not sufficient for classification
Irritation / Corrosion	R36	none	R36	
Sensitisation				Conclusive but not sufficient for classification
Carcinogenicity				Conclusive but not sufficient for classification
Mutagenicity – Genetic toxicity				Conclusive but not sufficient for classification
Toxicity to reproduction – fertility				Conclusive but not sufficient for classification
Toxicity to reproduction – development				Conclusive but not sufficient for classification
Toxicity to reproduction – breastfed babies. Effects on or via lactation				Conclusive but not sufficient for classification
Environment	Not classified	none	R52/53	Conclusive but not sufficient for classification

[1)] Including SCLs
[2)] Data lacking, inconclusive, or conclusive but not sufficient for classification

Labelling: Indication of danger: Xi
R-phrases: R36
S-phrases: S2,
S26

2 BACKGROUND TO THE CLH PROPOSAL

2.1 History of the previous classification and labelling

The current environmental classification results from no ready biodegradability and E_bC_{50} (algae) < 100 mg/L. According to the CLP Regulation the classification shall be based on E_rC_{50} (algae). The E_rC_{50} (algae) of 1,1',1"-nitrilotripropan-2-ol is greater than 100 mg/L, therefore the substance should not be classified for environment.

2.2 Short summary of the scientific justification for the CLH proposal

Data from registration dossiers were taken as a basis for this CLH proposal.

The reason for the requested change in classification is based on the consideration of the use of E_rC_{50} instead of the E_bC_{50}. According to the REACH guidance document R7b (ECHA, 2008) the use of the E_rC_{50} is preferred to the use of the E_bC_{50}: “Often both acute growth rate EC_{50} (E_rC_{50}) and biomass (E_bC_{50}) endpoints are reported however the latter should not be used. The reason is that direct use of the biomass concentration without logarithmic transformation cannot be applied to an analysis of results from a system in exponential growth.” (Guidance document R7b, section R.7.8.4, page 23).

Based on the available/presented data the classification/labelling with R 52/53 (aquatic chronic 3) is deemed to be not justified. The endpoints derived from acute aquatic toxicity studies are > 100 mg/L at each trophic level. Hence, the chemical is considered to be acutely not harmful to aquatic organisms including fish, aquatic invertebrates and algae. Though the chemical is not readily biodegradable, the classification is triggered by the aquatic toxicity. Further, the experimentally determined BCF was < 0.57. Therefore following the classification scheme according to CLP Regulation the test substance does not fall under the criteria for Aquatic Chronic 3 (R52/53).

In 1998 the ready biodegradability of the test substance was assessed in an OECD 301 F study performed for DOW Elanco. Biodegradation was not observed during the test period. In a DOC Die Away-Test according to OECD 301 A (Hüls AG, 1997) a biodegradation degree of 18% was measured after 28 d of exposure indicating that the chemical is not readily biodegradable. In a MITI test (1992) resembling the test guideline OECD 302 C the absence of inherent biodegradation was demonstrated. Further, an OECD 302 B BASF-study from 1981 demonstrated a low potential for elimination from water. In terms of the CLP criteria the test substance has to be considered as not rapidly degradable.

According to CLP criteria the test substance is not harmful to fish as was demonstrated in a BASF AG study performed in 1987. The 96 -h LC_{50} value calculated as geometrical mean was 3158 mg/L (nominal test item concentrations). This result is supported by an acute toxicty test conducted according to EU Method C.1 (Acute Toxicity for Fish) performed by Hüls (1997). In this limit-test no mortality was observed at 1000 mg/L (LC_{50} (96 h) >1000 mg/L, nominal confirmed by concentration control analysis).

A BASF AG study conducted in 1987 according to the test method presented in directive 79/831/EEC, Annex V, part C indicated that the test substance is according to CLP criteria also most probably not acutely harmful to aquatic invertebrates. The EC_{50} based on mobility of *D. magna* was determined to be > 500 mg/L (based on nominal concentrations). These results are supported by an acute toxicty test according to EU Method C.2 (Acute Toxicity for *Daphnia*) performed by Hüls (1997). The EC_{50} (48 h) was 857 mg/L (nominal, confirmed by concentration control analytics).

Finally, according to CLP criteria the test substance is most probably not acutely harmful to algae as demonstrated in a study sponsored by Sasol Germany GmbH in 1997. In a test according to EU method C.3 an E_rC_{50} of 710 mg/L was determined. These results are supported by a BASF study conducted in 1990. The E_rC_{50}, recalculated from fluorescence data, after 72 hours of exposure was determined to be > 100 mg/L.

The summarised results above combined with the high water solubility and the low bioconcentration factor demonstrate that the classification Aquatic Chronic 3 is not justified.

2.3 Current harmonised classification and labelling

2.3.1 Current classification and labelling in Annex VI, Table 3.1 in the CLP Regulation

Eye Irrit. 2
Aquatic Chronic 3

2.3.2 Current classification and labelling in Annex VI, Table 3.2 in the CLP Regulation

Xi; R36
R52/53

2.4 Current self-classification and labelling

2.4.1 Current self-classification and labelling based on the CLP Regulation criteria

Proposal: Eye Irrit. 2

2.4.2 Current self-classification and labelling based on DSD criteria

Proposal: Xi; R36

3 JUSTIFICATION THAT ACTION IS NEEDED AT COMMUNITY LEVEL

It is proposed that the substance is no more to be classified as aquatic chronic 3 (R52/53) based on the available test data presented in chapter 5. Harmonized classification and labelling for 1,1',1''-nitrilotripropan-2-ol is considered a Community-wide action under Article 42 and it is recommended that the classification proposal is considered for inclusion on Annex VI to Regulation (EC) No 1272/2008, table 3.1 and table 3.2.

Part B.

SCIENTIFIC EVALUATION OF THE DATA

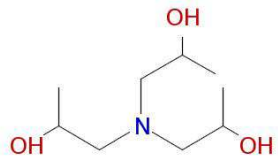
1 IDENTITY OF THE SUBSTANCE

1.1 Name and other identifiers of the substance

Table 5: Substance identity

EC number:	204-528-4
EC name:	1,1',1''-nitrilotripropan-2-ol; Triisopropanolamine
CAS number (EC inventory):	122-20-3
CAS number:	122-20-3
CAS name:	2-Propanol, 1,1',1''-nitrilotris-
IUPAC name:	1,1',1''-nitrilotripropan-2-ol
CLP Annex VI Index number:	603-097-00-3
Molecular formula:	$C_9H_{21}NO_3$
Molecular weight range:	191.27

Structural formula:



1.2 Composition of the substance (as manufactured)

Table 6: Constituents (non-confidential information)

Constituent	Typical concentration	Concentration range	Remarks
1,1',1"-nitrilotripropan-2-			

Current Annex VI entry: Eye Irrit. 2 (H 319), Aquatic Chronic 3 (H 412)

Table 7: Impurities (non-confidential information)

Impurity	Typical concentration	Concentration range	Remarks

Current Annex VI entry:
-.-

Table 8: Additives (non-confidential information)

Additive	Function	Typical ıcentration	Concentration range	Remarks

Current Annex VI entry:
-.-

1.2.1 Composition of test material

Physico-chemical and toxicological studies:

not relevant for this dossier. However, information on the test material used in the different studies is given in the IUCLID 5 dossier.

Eco-toxicological studies:

Information on the test material used is given in chapter 5 of this dossier and is reported in the IUCLID 5 dossier. The chemical is of high purity. Identified impurities are considered to be inoffensive for the environment.

1.3 Physico-chemical properties

Table 9: Summary of physico - chemical properties

Property	Value	Reference	Comment (e.g. measured or estimated)
State of the substance at 20°C and 101,3 kPa	solid	Lewis (1997)	Visual inspection
Melting/freezing point	45°C	Lide (1998)	Measured; handbook data
Boiling point	301°C (1013 hPa)	BASF (1972)	Measured: dynamic method, vapour measurement
Density	1.0 g/cm³ (20°C)	Lide (1998)	Measured, handbook data
Vapour pressure	0.000000008 hPa (20°C)	BASF (1972)	Measured, dynamic method, vapour measurement
Surface tension	Not surface active; based on chemical structure, no surface activity is to be expected	Expert judgment	Expert judgement: Based on the chemical structure surface activity is not expected
Water solubility	830 g/l (20°C)	Davis (1997), IPCS (2006)	Measured; published data
Partition coefficient n-octanol/water	-0.015 (23°C)	BASF (1987a)	Measured; OECD guideline 107, Shake flask method without adjustment of pH
Flash point	174°C (1013 hPa) c.c.	BASF (1978)	Measured, DIN 51758, Pensky-Martens closed cup method

Property	Value	Reference	Comment (e.g. measured or estimated)
Flammability upon ignition (solids)	Combustible when exposed to heat or flame Because of the low melting point, the substance is used in a liquid form therefore the flammability is deduced from flash point and boiling point.	Lewis (2004), Sax`s, 11th ed.	Measured
Flammability in contact with water	Not conducted (Testing can be waived)[1)]	BAM-II.2 (2010)	Expert judgement
Pyrophoric properties	Not conducted (Testing can be waived)[2)])	BAM-II.2 (2010)	Expert judgement
Explosion limits in air	(LEL/LFL) = 0.8 vol% (UEL/UFL) = 5.8 vol%	IPCS (2006)	Measured
Dust explosion hazard	Dust explosion possible if in powder or granular form, mixed with air. Combustion and explosion characteristic of dust are not available.	IPCS (2006)	Literature value
Explosive properties	Not conducted (Testing can be waived)[3)]	BAM-II.2 (2010)	Expert judgement
Self-ignition temperature	285°C	BASF (1978)	Measured, DIN 51794
Oxidising properties	Not conducted (Testing can be waived)[4)]	BAM-II.2 (2010)	Expert judgement
Stability in organic solvents and identity of relevant degradation products	Not applicable; the stability of the substance is not considered as critical	Expert judgment	Expert judgement
Dissociation constant	7.86 (25°C)	Schwabe (1959)	Measured, published data
Viscosity	100 mPa s (60°C)	Flick (1998)	Measured; handbook data
Log K_{OC}	-1.86 – 1.92	BASF assessment (2011)	Calculations using EPISuite for the uncharged molecule and application of Franco & Trapp (2008) calculation as well as correction factor as referenced in REACH guidance R.7, appendix R7.1-2 for the charged form; for further details see table 22 in this dossier

[1)] Testing can be waived based on a consideration of the chemical structure in accordance with Annex I, section 2.12.4.1 of the CLP Regulation: The classification procedure needs not to be applied because the organic substance does not contain metals or metalloids.

[2)] Testing can be waived in accordance with Annex I, section 2.10.4.1 of the CLP Regulation: The classification procedure needs not to be applied because the organic substance is known to be stable in contact with air at room temperature for prolonged periods of time (days).

[3)] Testing can be waived based on a consideration of the chemical structure in accordance with REACH Column 2 of Annex VII, section 7.11: The classification procedure needs not to be applied because there are no chemical groups present in the molecule which are associated with explosive properties.

[4)] Testing can be waived based on a consideration of the chemical structure in accordance with REACH Column 2 of Annex VII, section 7.13: The classification procedure needs not to be applied because the organic substance contains oxygen, which is chemically bonded only to carbon.

2 MANUFACTURE AND USES

2.1 Manufacture

Reaction of ammonia and propylenoxide at elevated temperature and pressure and further distillation.

2.2 Identified uses

In industrial settings 1,1',1"-nitrilotripropan-2-ol is used, besides manufacture and formulation, as an intermediate, as a processing aid for paper, textile and leather and as gas treatment. It is further used in metal working fluids and as an additive in fuel. Industrial uses are also the use in wood protection and as additive in plastic.

Professional uses include uses as additive in concrete and cement, as processing aid for paper, textile and leather as well as the use in metal working fluids. It is further used in coatings and adhesives, detergents and cleaners, as laboratory chemical and in fuels.

Consumers use the substance in concrete and cement, as well as in fuels. Further it is used in detergents and cleaners, wood protection formulations and in personal care products.

3 CLASSIFICATION FOR PHYSICO-CHEMICAL PROPERTIES

Chapter 3 is not relevant for this dossier.

4 HUMAN HEALTH HAZARD ASSESSMENT

Chapter 4 is not relevant for this dossier.

5 ENVIRONMENTAL HAZARD ASSESSMENT

5.1 Degradation

Table 21: Summary of relevant information on degradation

Method	Results	Remarks	Reference
Gas chromatography to study the stability of triisopropanolamine in an aqueous milieu Reliability 2: Peer reviewed data	Triisopropanolamine proved to be stable in water	Test item: Triisopropanolamine, purity: n.d.	Toropkov. 1980
OECD Guideline 301 F (Ready Biodegradability: Manometric Respirometry Test) Reliability 1: GLP guideline study	0% BOD/ThOD (28 d)	Test item: Triisopropanolamine, purity: 95%	Dow, 1998
OECD guideline 301 A (Ready Biodegradability: DOC Die Away Test) Reliability 2: Well documented study according to OECD guideline	18% DOC removal (28 d)	Test item: Triisopropanolamine	Huels AG, 1997
OECD Guideline 302 C (Inherent Biodegradability: Modified MITI Test (II)) Reliability 2: Guideline study with acceptable restrictions	3.4% BOD/ThOD (28 d)	Test item: tris(2-hydroxypropyl)amine [synonym: triisopropanolamine], purity: n.d.	MITI, 1992
According to OECD Guideline 302 B (Inherent biodegradability: Zahn-Wellens/EMPA Test) Reliability 2: Guideline study with acceptable restrictions	<10% DOC (28d)	Inoculum: activated sludge, industrial; Test item: Triisopropanolamine, purity: n.d.	BASF, 1981
EPA Subdivision N Pesticide Guideline 162-4 (Aerobic Aquatic Metabolism) Reliability 1: GLP guideline study	39% $^{14}CO_2$, radiochem. meas. (30d); 64% radiochem. meas. (64d); half-life: 14.3 days	Test item: Triisopropanolamine, purity: 99.5%	Krieger, 1995
EPA Subdivision N Pesticide Guideline 162-3 (Anaerobic Aquatic Metabolism) Reliability 1: GLP guideline study	<1% $^{14}CO_2$, radiochem. meas. (6m)	Test item: Triisopropanolamine, purity: 99.5%	Cleveland, 1995a
EPA 162-1: Aerobic soil metabolism study Reliability 1: GLP guideline study	66-72% $^{14}CO_2$, radiochem. meas. (20d)	Test item: Triisopropanolamine, purity: n.a. purity (radiolab.): 95+x%	Cleveland, 1995b

5.1.1 Stability

Toropkov (1980) used gas chromatography to study the stability of triisopropanolamine in an aqueous milieu. No details of the tested concentration range, temperature range or pH range were provided. According to Toropkov, triisopropanolamine proved to be stable in water. At environmental pH conditions hydrolysis is not expected to be a relevant degradation process due to the absence of hydrolysable groups (Kollig et al. 1993, Boethling and Mackay 2000).

5.1.2 Biodegradation

5.1.2.1 Biodegradation estimation

No data.

5.1.2.2 Screening tests

The ready biodegradability of the test substance was assessed according to OECD 301 F. Biodegradation was not observed during the test period (Dow, 1998). In this test domestic non-adapted activated sludge was exposed to the test substance for 28 days. Additionally to the test item replicates, inhibition controls with benzoate and reference replicates were set up. After connection to the respirometer system, the reaction vessels were purged with ambient air, and the associated headspace volume of each individual reaction vessel was determined by the respirometer system. The reaction vessels were maintained in a dark room at a temperature of 22 ± 1 °C and continuously stirred over the 28-day period. Measurements of gas phase O2 and CO2 in the reaction vessels occurred on 4-hour sample intervals throughout the 28-day test period. The inhibition control demonstrated that the test substance was not inhibitory to the activated sludge.

In a DOC die away test performed by Sasol in 1997 the test substance was tested for ready biodegradation using domestic non-adpapted activated sludge. At the end of the 28 day exposure period only 18% of the test substance were degraded.

In a MITI test (1992) resembling the test guideline OECD 302 C the absence of inherent biodegradation was demonstrated. The measured BOD after 4 weeks of exposure was 3.4%. 30 mg/L of the test substance were incubated with 100 mg/L MITI inoculum (mixture of sewage, soil and natural water collected from different places in Japan) as recommended by OECD Test guideline 302C (Modified MITI test). Further, an OECD 302 B BASF-study from 1981 demonstrated a low potential for elimination from water. In the test industrial activated sludge at a concentration of 1 g/L dry substance was exposed to 400 mg/L DOC of the test substance for 28 days in well aerated glass vessels. DOC removal at the end of the test was below 10%.

Taking into account all available data the test substance is considered to be not rapidly biodegradable in terms of the CLP criteria.

5.1.2.3 Simulation tests

Aerobic degradation in a water/sediment system and anaerobic degradation in a water/sediment system were conducted for Dow Elanco (Krieger, 1995). A half-life of 14.3 days was determined for the aerobic degradation of the test substance in the water/sediment system, indicating that 1,1',1''-nitrilotripropan-2-ol will not persist in aerobic aqueous compartments. The major identified metabolite was (2-oxopropyl)diisopropanolamine. For this metabolite no further information is available. After 30 days of exposure 39% of the applied radioactivity were found as $^{14}CO_2$ and after 60 days the amount of produced $^{14}CO_2$ increased to 64%. This demonstrates that TIPA is not rapidly biodegradable but is not persistent in the water compartment.

The anaerobic degradation in a water/sediment system demonstrated that the test substance was not degraded during an observation time of 6 months (Cleveland, 1995a).

In a study conducted for Dow Elanco (Cleveland, 1995b) the degradation of the test substance in two different soils was determined to be between 66 and 72% based on the evolution of $^{14}CO_2$, indicating that 1,1',1"-nitrilotripropan-2-ol will not persist in soil. The major identified metabolite was 1,1'-iminodipropan-2-ol (CAS 110-97-4), which is also an impurity of the test substance and is considered to be non-toxic to the aquatic environment and readily biodegradable (further information on the metabolite 1,1'-iminodipropan-2-ol may be obtained on: ECHA: Information on Registered Substances: http://apps.echa.europa.eu/registered/registered-sub.aspx#search).

5.1.3 Summary and discussion of degradation

Abiotic degradation due to hydrolysis is not expected as was demonstrated by Toropkov (1980). 1,1',1"-nitrilotripropan-2-ol proved to be stable in water. Further, at environmental pH conditions hydrolysis is not expected to be a relevant degradation process due to the absence of hydrolysable groups (Kollig et al. 1993, Boethling and Mackay 2000).
In screening tests 1,1',1"-nitrilotripropan-2-ol was found to be not biodegradable. However, in the water/sediment system the test substance has a half-life of 14.3 days under aerobic conditions. After 30 and 60 days of exposure 39% and 64% of the applied radioactivity were recovered as $^{14}CO_2$, respectively, indicating that 1,1',1"-nitrilotripropan-2-ol will not persist in aerobic aqueous compartments. In anaerobic media no biodegradation was observed after 6 month of exposure. In natural soil 1,1',1"-nitrilotripropan-2-ol is mineralised to an extent of 66 to 72%. Therefore, 1,1',1"-nitrilotripropan-2-ol is not rapidly or inherently biodegradable in regulatory terms but it does not persist in water/sediment systems due to degradation in surface water and in soil.

Based on the presented data the test substance is considered to be not rapidly biodegradable according to CLP criteria.

5.2 Environmental distribution

Table 22: Summary of relevant information on environmental distribution

Method	Results	Remarks	Reference
SRC PCKOC v2.0 calculation MCI based calculation Reliability 2: Scientifically acceptable method	Adsorption coefficient: log Koc: 1 (Koc estimate from MCI)	Test item: 1,1',1''-nitrilotripropan-2-ol	BASF AG, 2010
SRC PCKOC v2.0 calculation log Kow based calculation Reliability 2: Scientifically acceptable method	Adsorption coefficient: log Koc: 0.0258	Test item: 1,1',1''-nitrilotripropan-2-ol	BASF AG, 2010
Calculation of log Koc for ionized molecule Reliability 2: Scientifically acceptable method	Adsorption coefficient: log Koc: 1.92 (pH 5.0) log Koc: 1.87 (pH 7.0) log Koc: 1.34 (pH 9.0)	Test item: 1,1',1''-nitrilotripropan-2-ol	BASF SE, 2010 Franco A. & Trapp S., 2008
Calculation based on the correction factor recommende by ECHA guidance document R.7, appendix R7.1-2, page 190 to be used for ionisable substances Reliability 2: Scientifically acceptable method	Adsorption coefficient: log Koc: -1.86 (pH 5.0) log Koc: 0.08 (pH 7.0) log Koc: 0.97 (pH 9.0)	Test item: 1,1',1''-nitrilotripropan-2-ol	BASF SE, 2011
SRC HENRYWIN v3.10 calculation Reliability 2: Scientifically acceptable method	Henry's Law constant H: 0.000001 Pa m³/mol at 25 °C	Test item: 1,1',1''-nitrilotripropan-2-ol	BASF AG, 2007b
Mackay level I calculation Calculation programme: Level I Model, Version 3.00 Reliability 2: Scientifically acceptable method	Percent distribution in media: Water (%): 100 Soil (%): 0.01 Sediment (%): 0.01	Test item: 1,1',1''-nitrilotripropan-2-ol	BASF AG, 2007c

5.2.1 Adsorption/Desorption

Calculated logKoc-values of 1.0 and 0.0258 are available based on estimates from MCI and log Kow, respectively (BASF SE, KOCWIN v2.00, 2010). This value refers to the uncharged molecule (pKa value: 7.86). The pKa value indicates that the molecule will exist partly as a cation in the environment at neutral to acidic pH conditions. Cations generally adsorb stronger to soils containing organic carbon and clay than their neutral counterparts. Hence, the PCKOC-model may underestimate adsorption to organic carbon since it does not consider the ionic structure of the molecule. Under environmental conditions (pH from 5 to 9) the test substance is partly present in its charged form (as calculated by the formula % ionised = 100/(1+10(pKa - pH)): 7% at a pH of 9, 88% at pH 7, 100% at pH 5). In a calculation conducted according to a publication by Franco & Trapp, 2008 using the parameters pKa = 7.86 and log Pow = -1.22 for the uncharged molecule log Koc values of 1.92, 1.87 and 1.34 were determined for the pH values 5, 7 and 9, respectively.

The environmental pH value influences the sorption behaviour of ionisable substances. Based on the *Guidance on information requirements and chemical safety assessment Chapter R.7a: Endpoint specific guidance document, Appendix R.7.1-2 pH correction of partition coefficients for ionisable substances* a correction factor to account for this influence may be applied to the values determined for the uncharged molecules. Using this correction factor on the calculated

worst case Koc of 10 (MCI-method of PCKOC-model in Episuite), the resulting corrected log Koc was determined to be -1.86, 0.084 and 0.97 for the environmentally relevant pH values of 5, 7 and 9, respectively.

5.2.2 Volatilisation

A Henry law constant of 0.000001 Pa*m³/mol was calculated by SRC HENRYWIN v3.10 for the uncharged molecule (BASF SE, 2007b), indicating that the molecule will not evaporate into the atmosphere from the water surface.

5.2.3 Distribution modelling

Over time, the substance will preferentially distribute into the compartment water (100 %; Mackay Level I) (BASF SE, 2007c).

5.3 Aquatic Bioaccumulation

Table 23: Summary of relevant information on aquatic bioaccumulation

Method	Results	Remarks	Reference
OECD Guideline 305 C (Bioaccumulation: Test for the Degree of Bioconcentration in Fish) Species: C*yprinus carpio* Reliability 2: Guideline study with acceptable restrictions	BCF <0.57 (0.25 mg/L); BCF <0.06 (2.5 mg/L)	Test item: tris(2-hydroxypropyl)amine [synonym: triisopropanolamine], purity: n.d.	MITI, 1992

5.3.1 Aquatic bioaccumulation

5.3.1.1 Bioaccumulation estimation

The bioaccumulation of the substance was not estimated, as measured bioaccumulation data from a MITI test according to OECD TG 305 C was available.

5.3.1.2 Measured bioaccumulation data

A MITI test (1992) according to guideline OECD 305 C resulted in bioconcentration factors of < 0.06 and < 0.57 at exposure concentrations of 2.5 mg/L and 0.25 mg/L, respectively. In the presented study carp were continuously exposed to the test chemical for 6 weeks in a flow-through system at a flow rate of 290 – 1150 L/d at 25 °C. The dissolved oxygen levels were kept at 6 – 8 mg/L. Fish were about 10 cm long and had an average body weight of 30 g, the lipid content was 2 - 6%. After termination of the exposure period the content of the test chemical in the whole fish was determined.

The study on the bioaccumulation in aquatic organisms (MITI, 1992) and the low measured log K_{OW} of -0.015 demonstrate that the test substance does not accumulate in aquatic organisms. According to CLP criteria the test substance is not bioaccumulative.

5.3.2 Summary and discussion of aquatic bioaccumulation

A study on the bioaccumulation in aquatic organisms (MITI, 1992) demonstrated that the test substance does not accumulate in aquatic organisms. According to CLP criteria a bioaccumulation factor of ≥ 500 and/or a partition coefficient octanol/water (log Kow) of > 4 is indicative for the potential to bioconcentrate. Compared to the experimentally determined bioconcentration factor of < 0.57 and the measured log Kow of -0.015 classification triggered by bioconcentration is not justified.

5.4 Aquatic toxicity

Table 24: Summary of relevant information on aquatic toxicity

Method	Results	Remarks	Reference
Fish			
Leuciscus idus - DIN 38412, Part 11 Reliability 2: Non-GLP study in accordance with german national industrial standard test guidelines. No analytical test item concentration verification.	LC50 (96 h): 3158.48 mg/L (geometric mean; nominal)	Test item: Triisopropanolamine, purity: >99% Due to the high water solubility, the test item was directly added to the test medium. The test was performed under static conditions. Test concentrations were 0, 1000, 2150, 4640 and 10000 mg/L. Additionally a neutralised sample of 10000 mg/L was also tested. Neutralisation did not alter the toxicity of the test substance. pH values ranged from 8.0 to 10.0 during the test. Dissolved oxygen concentrations ranged from 8.1 to 8.9 mg/L.	BASF AG, 1987b
Cyprinus carpio - EU Method C.1 (Acute Toxicity for Fish; limit test) Reliability 1: GLP-guideline study with analytical verification of test item concentrations	LC50 (96 h): > 1000 mg/L (nominal)	Test item: Triisopropanolamine, purity: >98.6%	Huels AG, 1997a
Pimephales promelas - Standard Methods for the	maximum safe level without mortality or	Test item: Triisopropanolamine, purity: n.d.	Dow, 1975

Method	Results	Remarks	Reference
Examination of Water and Wastewater, 13th Edition, 1971, American Public Health Assn., NY, NY 10019. Reliability 2: This study was conducted prior to GLP and test guidelines, but sufficient data is available for interpretation of results	observable effects (96 h): > 100 mg/L	Due to the high water solubility, the test item was prepared in stock solutions using distilled water. The test was performed under static exposure conditions.	
invertebrates			
Daphnia magna - Directive 79/831/EEC, Annex V, Part C Reliability 2: Non-GLP study in accordance with european standard test guidelines. No analytical test item concentration verification.	EC50 (48 h): > 500 mg/L (nominal), no immobile daphnids observed	Test item: Triisopropanolamine, purity: n.d. A stock solution with a nominal concentration of 500 mg/l was prepared. The test solutions were fixed by serial dilution of the stock solution. The test was performed under static exposure conditions. Test concentrations were 0, 7.81, 15.6, 31.2, 62.5, 125, 250 and 500 mg/L. During the test the pH value ranged from 7.56 to 9.05. Dissolved oxygen ranged from 8.23 to 8.94 mg/L. The test was performed in 4 replicates per test concentration.	BASF AG, 1987c
Daphnia magna - EU Method C.2 (Acute Toxicity for Daphnia) Reliability 1: GLP-guideline study with analytical verification of test item concentrations	EC50 (48 h): 857 mg/L (nominal)	Test item: Triisopropanolamine, purity: >98.6% A stock solution with a nominal concentration of 2.03 g/L was prepared. The test solutions were fixed by serial dilution of the stock solution. The test was performed under static exposure conditions. Test concentrations were 0, 120, 180, 250, 350, 500, 700 and 1000 mg/L. The test was performed in 4 replicates per test concentration.	Huels AG, 1997b
algae			
Scenedesmus subspicatus (new name: Desmodesmus subspicatus) - EU Method C.3 (Algal Inhibition test) Reliability 1: GLP-guideline study with analytical verification of test item concentrations	EC50 (72 h): 710 mg/L (growth rate) (nominal) EC50 (72 h): 50 mg/L (cell number) (nominal)	Test item: Triisopropanolamine, purity: >98.6% A stock solution with a nominal concentration of 2.03 g/L was prepared. The test solutions were fixed by serial dilution of the stock solution. The test was performed under static exposure conditions. Test was performed in two sets using the following test substance concentrations: set 1: 4, 10, 26, 64, 160, 400 and 1000 mg/Lconcentrations were 0, 120, 180, 250, 350, 500, 700 and 1000 mg/L. set 2: 0.2, 0.64 and 1.6 mg/L. The test was performed in 5 replicates	Huels AG, 1997c
Scenedesmus subspicatus (new name: Desmodesmus subspicatus) (algae)	EC50 (72 h): > 100 mg/L (growth rate) (nominal) EC50 (72 h): 64.67 mg/L	Test item: Triisopropanolamine, purity: n.d. The test was performed under	BASF AG, 1989, ECT

Method	Results	Remarks	Reference
- DIN 38412, Part 9 Reliability 2: Non-GLP study in accordance with european standard test guidelines. No analytical test item concentration verification.	(biomass) (nominal) Values were recalculated from the fluorimetric data according to OECD 201 using ToxRatPro v2.09	static exposure conditions. The test substance concentrations were: 1.56, 3.13, 6.25, 12.5, 25, 50, 100 mg/L. Additionally a neutralised sample of 100 mg/L was tested. During the test the pH value ranged from 7.97 to 9.60. The test was performed in 4 replicates	Oekotoxikologie GmbH (2008)

5.4.1 Fish

5.4.1.1 Short-term toxicity to fish

The test substance is not harmful to fish as was demonstrated in a BASF AG study from 1987. The 96 -h LC_{50} value calculated as geometrical mean is 3158 mg/L. This result is supported by an acute toxicty test according to EU Method C.1 (Acute Toxicity for Fish) from Hüls (1997). In this limit-test no mortality was observed at 1000 mg/L (LC_{50} (96 h) >1000 mg/L, nominal confirmed by concentration control analytics).

5.4.1.2 Long-term toxicity to fish

No data available

5.4.2 Aquatic invertebrates

5.4.2.1 Short-term toxicity to aquatic invertebrates

A BASF AG study conducted in 1987 indicated that the test substance is also most probably not acutely harmful to aquatic invertebrates. The EC_{50} based on mobility of *D. magna* was determined to be > 500 mg/L. These results are supported by an acute toxicty test according to EU Method C.2 (Acute Toxicty for *Daphnia*) from Hüls (1997). The EC_{50} (48 h) was 857 mg/L (nominal, confirmed by concentration control analytics). Short-term toxicity to aquatic invertebrates

5.4.2.2 Long-term toxicity to aquatic invertebrates

No data available

5.4.3 Algae and aquatic plants

The test substance is most probably not acutely harmful to algae as demonstrated by a study sponsored by Sasol Germany GmbH in 1997. In a test according to EU method C.3 an E_rC_{50} of 710 mg/L was determined. These results are supported by a BASF study conducted in 1990. The E_rC_{50}, recalculated from the fluorescence data, after 72 hours of exposure was determined to be > 100 mg/L.

5.4.4 Other aquatic organisms (including sediment)

None.

5.5 Comparison with criteria for environmental hazards (sections 5.1 – 5.4)

1,1',1"-nitrilotripropan-2-ol is not readily, nor easily or inherently biodegradable in regulatory terms but it rapidly dissipates from the environment due to degradation in surface water/sediment and in soil. The endpoints derived from acute aquatic toxicity studies are > 100 mg/L at each trophic level. Hence, the chemical is considered to be acutely not harmful to aquatic organisms including fish, aquatic invertebrates and algae. The experimentally determined BCF was < 1 indicating that the bioaccumulation potential is low.

Abiotic degradation due to hydrolysis is not expected as was demonstrated by Toropkov (1980). 1,1',1"-nitrilotripropan-2-ol proved to be stable in water. Further, at environmental pH conditions hydrolysis is not expected to be a relevant degradation process due to the absence of hydrolysable groups (Kollig et al. 1993, Boethling and Mackay 2000).

In 1998 the ready biodegradability of the test substance was assessed in an OECD 301 F study performed for DOW Elanco. Biodegradation was not observed during the test period. In a DOC Die Away-Test according to OECD 301 A (Hüls AG, 1997) a biodegradation degree of 18% was measured after 28 d indicating that the chemical is not readily biodegradable. In a MITI test (1992) resembling the test guideline OECD 302 C for inherent biodegradability demonstrated the absence of inherent biodegradation. Further, an OECD 302 B BASF-study from 1981 demonstrated a low potential for elimination from water.

In screening tests 1,1',1"-nitrilotripropan-2-ol was found to be not biodegradable. However, in the water/sediment compartment the test substance has a half-life of 14.3 days under aerobic conditions. After 30 and 60 days of exposure 39% and 64% of the applied radioactivity were recovered as CO_2, respectively, indicating that 1,1',1"-nitrilotripropan-2-ol will not persist in aerobic aqueous compartments. In anaerobic media no biodegradation is observed after 6 month of exposure. In natural soil 1,1',1"-nitrilotripropan-2-ol is mineralised to an extent of 66 to 72%. Therefore, 1,1',1"-nitrilotripropan-2-ol is not rapidly or inherently biodegradable in regulatory terms but it does not persist in the environment due to degradation in surface water and in soil. However, according to CLP criteria this environmental fate can not account for an alteration of the classification.

Based on the calculated Koc values for charged and uncharged molecules at different pH values ranging from a minimum of 0.014 to a maximum of 10 and the Henrys Law Constant of 0.000001 Pa*m3/mol, the test chemical can be considered as not adsorptive to the solid phase of soil and sediment further it does not evaporate into the air from the water surface.

A study on the bioaccumulation in aquatic organisms (MITI, 1992) demonstrated that the test substance does not accumulate in aquatic organisms. According to CLP criteria a bioaccumulation factor of ≥ 500 and/or a partition coefficient octanol/water (log Kow) of > 4 is indicative of the potential to bioconcentrate for classification purposes. Compared to the experimentally determined bioconcentration factor of < 1 and the measured log Kow of -0.013 classification triggered by bioconcentration is not justified.

The test substance is not harmful to fish as was demonstrated in a BASF AG study from 1987. The 96 -h LC_{50} value calculated as geometrical mean is 3158 mg/L. This result is supported by an acute toxicty test according to EU Method C.1 (Acute Toxicity for Fish) from Hüls (1997). In this limit-test no mortality was observed at 1000 mg/L (LC_{50} (96 h) >1000 mg/L, nominal confirmed by concentration control analytics).

Based on CLP criteria, the low acute toxicity of the test chemical to fish does not trigger a classification of the test substance.

A BASF AG study conducted in 1987 indicated that the test substance is also most probably not acutely harmful to aquatic invertebrates. The EC_{50} based on mobility of *D. magna* was determined to be > 500 mg/L. These results are supported by an acute toxicty test according to EU Method C.2 (Acute Toxicty for *Daphnia*) from Hüls (1997). The EC_{50} (48 h) was 857 mg/L (nominal, confirmed by concentration control analytics).

Based on CLP criteria, the low acute toxicity of the test chemical to aquatic invertebrates does not trigger a classification of the test substance.

Finally, the test substance is most probably not acutely harmful to algae as demonstrated by a study sponsored by Sasol Germany GmbH in 1997. In a test according to EU method C.3 an

E_rC_{50} of 710 mg/L was determined. These results are supported by a BASF study conducted in 1990. The E_rC_{50}, recalculated from the fluorescence data, after 72 hours of exposure was determined to be > 100 mg/L.
Based on CLP criteria, the low toxicity of the test chemical to algae does not trigger a classification of the test substance.

Table 25: CLP criteria compared to the reported results

Endpoint	**Results**	**CLP legislation**	**Classification**
Stability in water	Stable in water	**4.1.2.9.2**: abiotic degradation of > 70% under environmental conditions **4.1.2.9.4**: …Hydrolysis can be considered if the hydrolysis products do not fulfil the criteria for classification as hazardous to theaquatic environment	no rapid degradability
OECD Guideline 301 F (Ready Biodegradability: Manometric Respirometry Test)	0% BOD/ThOD (28 d)	**4.1.2.9.5.(a)(i)**: 60% after 28 days	no rapid degradability
OECD guideline 301 A (Ready Biodegradability: DOC Die Away Test)	18% DOC removal (28 d)	**4.1.2.9.5.(a)(ii)**: 70% after 28 days	no rapid degradability
OECD Guideline 302 C (Inherent Biodegradability: Modified MITI Test (II))	0% BOD/ThOD (14 d) 3.4% BOD/ThOD (28 d)	***Guidance on the Application of Regulation (EC) No 1272/2008, p. 406:*** Inherent-(OECD 302) and sewage treatment simulation (OECD 303) tests are not normally used in thiscontext, due to the high levels of adapted biomass.	no rapid degradability
OECD Guideline 302 B (Inherent biodegradability: Zahn-Wellens/EMPA Test)	< 10% DOC (28d)	***Guidance on the Application of Regulation (EC) No 1272/2008, p. 406:*** Inherent-(OECD 302) and sewage treatment simulation (OECD 303) tests are not normally used in thiscontext, due to the high levels of adapted biomass.	no rapid degradability
EPA Subdivision N Pesticide Guideline 162-4 (Aerobic Aquatic Metabolism)	39% $^{14}CO_2$, radiochem. meas. (30d); 64% radiochem. meas. (64d); half-life: 14.3 days	**4.1.2.9.3**: …degradation half-lives […] can be used in defining rapid degradation provided that ultimate biodegradation of the substance, i.e. full mineralisation, is achieved. **4.1.2.9.3**: Primary biodegradation does not normally suffice in the assessment of rapid degradability unless it can be demonstrated that the degradation products do not fulfil the criteria for classification ashazardous to the aquatic environment.	no rapid degradability
EPA Subdivision N Pesticide Guideline 162-3 (Anaerobic Aquatic Metabolism)	< 1% $^{14}CO_2$, radiochem. meas. (6m)	***Guidance on the Application of Regulation (EC) No 1272/2008, p. 406:*** Anaerobic degradation tests (OECD 311/ISO 11734 and analogous tests) do not qualify because of the specificity of the anaerobic compartments.	no rapid degradability
EPA 162-1: Aerobic soil	66-72% $^{14}CO_2$,	***Guidance on the Application of***	rapid

metabolism study	radiochem. meas. (20d)	***Regulation (EC) No 1272/2008, p. 459; II.2.3.6.(c):*** …the substance is ultimately degraded within 28 days with a half-life < 16 days corresponding to a degradation rate > 0.043 day-1	degradability
Conclusion: Only the study on the degradation of the test substance in soil demonstrated rapid degradability. However, any other test on degradation presented demonstrates the lack of rapid degradation and hence, the test substance is not considered to rapidly degrade in the environment			
OECD Guideline 305 C (Bioaccumulation: Test for the Degree of Bioconcentration in Fish) Species: C*yprinus carpio*	BCF <0.57 (0.25 mg/L); BCF <0.06 (2.5 mg/L)	4.1.2.8.1: A BCF in fish of ≥ 500 is indicative of the potential to bioconcentrate for classification purposes.	not bioaccumu-lative
The test substance does not fulfil the criteria for bioaccumulation potential			

Leuciscus idus - DIN 38412, Part 11	LC50 (96 h): 3158.48 mg/L (geometric mean; nominal)	4.1.2.6.; Table 4.1.0	**Since all relevant available data on the acute toxicity are above the trigger value of 100 mg/L the test substance is not considered to be harmful to aquatic life**
Cyprinus carpio - EU Method C.1 (Acute Toxicity for Fish; limit test)	LC50 (96 h): > 1000 mg/L (nominal)		
Pimephales promelas - Standard Methods for the Examination of Water and Wastewater, 13th Edition, 1971, American Public Health Assn., NY, NY 10019.	maximum safe level without mortality or observable effects (96 h): > 100 mg/L		
Daphnia magna - Directive 79/831/EEC, Annex V, Part C	EC50 (48 h): > 500 mg/L (nominal), no immobile daphnids observed		
Daphnia magna - EU Method C.2 (Acute Toxicity for Daphnia)	EC50 (48 h): 857 mg/L (nominal)		
Scenedesmus subspicatus (new name: Desmodesmus subspicatus) - EU Method C.3 (Algal Inhibition test)	EC50 (72 h): 710 mg/L (growth rate) (nominal) EC50 (72 h): 50 mg/L (cell number) (nominal)		
Scenedesmus subspicatus (new name: Desmodesmus subspicatus) (algae) - DIN 38412, Part 9	EC50 (72 h): > 100 mg/L (growth rate) (nominal) EC50 (72 h): 64.67 mg/L (biomass) (nominal)		

5.6 Conclusions on classification and labelling for environmental hazards (sections 5.1 – 5.4)

The summarised results above combined with the high water solubility and the low bioconcentration factor demonstrate that the classification Aquatic Chronic 3 is not justified.

6 OTHER INFORMATION

7 REFERENCES

BAM, 2010 Expert judgement by BAM Federal Institute for Materials Research and Testing, Division II.2

BASF AG, 1972: Stoffwertmessungen, testing laboratory: BASF AG, Department of process engineering, report-no.: 172.096.1, report date: 1972-04-06

BASF AG, 1978: Sicherheitstechnische Kenndaten, testing laboratory: BASF AG, TLM/SIK - B 14, report-no.: SIK 78/0966, report date: 1978-10-20

BASF AG, 1981: Standversuch; unpublished data

BASF AG, 1987a: Octanol-Wasser-Verteilungskoeffizient POW von fünf Alkanolaminen bei 23 ° C, testing laboratory: BASF AG, Department of analytics, report-no.: BRU 87.262, report date: 1987-12-18

BASF AG, 1987b: Report on the study of the acute toxicity, testing laboratory: Department of Toxicology, study number: 10F0271/875176, report date: 1987-12-02

BASF AG, 1987c: Bestimmung der akuten Wirkung von Triisopropanolamin gegenueber dem Wasserfloh Daphnia magna Straus, testing laboratory: Department of Ecology, study number: 1/1133/2/87-1133/87, report date: 1987-01-27

BASF AG, 1989: Algenzellvermehrungshemmtest, testing laboratory: Department of Ecology, study number: 2/1090/88, report date: 1989-10-26

BASF SE, 2007a. SRC HENRYWIN v3.10 calculation, unpublished data, Department of Product Safety, report date: 2007-10-12

BASF SE, 2007b. Calculation according Mackay, Level I v3.00. unpublished data. Department of Product Safety, report date: 2007-12-11.

BASF SE, 2010. SRC KOCWIN v2.0 calculation, unpublished data, Department of Product Safety, report date: 2010-08-04

BASF SE, 2011. Correction factor for ionisable substances according to guidance R.7, appendix R7.1-2, page 190, unpublished data, Department of Product Safety, report date: 2011-06-20

Boethling R and Mackay D (2000): Handbook of Property Estimation Methods for Chemicals. CRC Press, Boca Raton, FL, USA.

Cleveland CB and Ulmer JJ, 1995a: Anaerobic aquatic metabolism study for Triisopropanolamine (TIPA): Requested 2,4-D moiety study; cited in OECD SIDS, 2009

Cleveland, C.B. and Ulmer, J.J., 1995b: Aerobic Soil Metabolism Study of Triisopropanolamine (TIPA): a 2,4-D Requested Moiety Study; cited in OECD SIDS, 2009

Davis JW, Carpenter CL., 1997: Rev Environ Contam Toxicol, 149 (1997), p. 87-137, cited by HSDB 21 Sep 2006

Dow Chemical Company, 1975: The Pollutional Evaluation of Compounds, testing laboratory: The Dow Chemical Company, cited in OECD SIDS program (2009); Industry sponsor: Dow Chemical Company, OECD SIDS program - Propanolamines category (DIPA: CAS-# 110-97-4; TIPA: CAS-# 122-20-3)

DOW Chemical Company, 1998: Evaluation of Ready Biodegradability of Monoisopropanolamine, Diisopropanolamine, and Triisopropanolamine Using the OECD Method

301F: Manometric Respirometry Test

ECHA: Information on Registered Substances: http://apps.echa.europa.eu/registered/registered-sub.aspx#search).

ECT Oekotoxikologie GmbH, 2008: Statistical evaluation with ToxRatPro (v2.09) of BASF algae study, report No. 2/1090/88, test date: 16 Aug 1989, study number: 2/1090/88, report date: 2008-08-12

European Commission, Directorate General JRC, Joint Research Centre, Environment Institute, European Chemicals Bureau (1997): ECBI/48/97 - Rev. 1, Summary Record, Commission Working Group on the Classification and Labelling of Dangerous Substances: Environmental Effects, Belgirate, 10-12 September 1997

http://apps.kemi.se/nclass/SubstanceInfo.asp?id=27888

Flick, E.W., 1998: Industrial Solvents Handbook (5th Edition), 1998 William Andrew Publishing/Noyes; © 2008 Knovel Corporation. All rights reserved

Franco A. & Trapp S., 2008: Estimation of the soil-water partition coefficient normalized to organic carbon for ionizable organic chemicals; Environmental Toxicology and Chemistry, 27 (10), pages: 1995-2004

Huels AG, 1997a: Bestimmung der akuten Wirkung von Triisoprpanolamin gegenueber Fischen, testing laboratory: Huels AG, Germany, report no.: FK 1386, study number: 2492, report date: 1997-04-30

Huels AG, 1997b: Bestimmung der Auswirkungen von Triisopropanolamin auf das Schwimmverhalten von Daphnia magna, testing laboratory: Huels AG, Germany, report no.: DK-693, study number: 2491, report date: 1997-03-03

Huels AG, 1997c: Bestimmung der Auswirkungen von Triisopropanolamin auf das Wachstum von Scenedesmus subspicatus 86.81. SAG, testing laboratory: Huels AG, Germany, report no.: AW-454, study number: 2489, report date: 1997-04-30

IPCS (2006): ICSC: 0592, 2006: 1,1',1"-nitrilotripropan-2-ol, Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities

Kollig, HP et al. (1993). Environmental fate constants for organic chemicals under consideration for EPA's hazardous waste identification projects. EPA/600/R-93/132.

Krieger MS, 1995: Aerobic Aquatic Metabolism of 14C-Triisopropanolamine (TIPA); cited in OECD SIDS, 2009

Lewis, R.J., Sr (Ed.), 1997: Hawley's Condensed Chemical Dictionary. 13th ed. New York, NY: John Wiley & Sons, Inc. 1997., p. 1134, cited in HSDB2007-09-01

Lewis, R.J., Sr, 2004: NEI500, 1,1',1"-Nitrilotri-2-propanol, Sax's Dangerous Properties of Industrial Materials, 11th ed; Volumes 1-3; John Wiley & Sons

Lide, D.R. (Ed.), 1998: CRC Handbook of Chemistry and Physics. 79thed. Boca Raton, FL: CRC Press Inc., 1998-1999., p. 3-284, cited in HSDB 2006-09-21

MITI, 1992: Biodegradation and Bioaccumulation Data of Existing Chemicals Based on the CSCL Japan; Japan Chemical Industry Ecology-Toxicology & Information Center, Oct 1992, 2-56; (http://www.safe.nite.go.jp/english/db.html)

Schwabe et al., 1959: Z.Phys.Chem. (Munich), 20, 68,78; cited in Beilstein Registry Number 1071570

Toropkov VV, 1980: Hygienische Begründung der maximal zulässigen Konzentration von Mono-, Di und Triisopropanolamin im Wasser von Gewässern; German translation from: Gig. Sanit. 3, 79-81; Cited in BUA report from 1995