GPS Safety Summary

Substance Name:

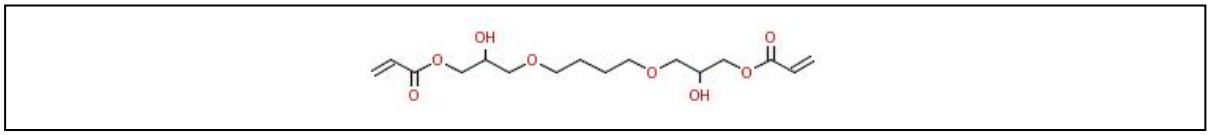
1,4-butanediylbis[oxy(2-hydroxy-3,1-propanediyl)] diacrylate

1. General Statement

1,4-butanediylbis[oxy(2-hydroxy-3,1-propanediyl)] diacrylate is a difunctional acrylic oligomer which can be polymerised by free radicals. In particular, 1,4-butanediylbis[oxy(2-hydroxy-3,1-propanediyl)] diacrylate is designed for use in ultra violet and electron beam curing applications.

2. Chemical Identity

Name:	**1,4-butanediylbis[oxy(2-hydroxy-3,1-propanediyl)] diacrylate**
Brand names:	CN 132
Chemical name (IUPAC):	Butane-1,4-diylbis(oxy-2-hydroxypropane-3,1-diyl) bisacrylate
CAS number(s):	52408-42-1
ES number:	257-900-3
Molecular formula:	$C_{16}H_{26}O_8$ (main component of the UVCB)
Structure:	



3. Use and applications

1,4-butanediylbis[oxy(2-hydroxy-3,1-propanediyl)] diacrylate (butanediol diglycidyl ether diacrylate (BDDGE diacrylate), is a low viscosity aliphatic diacrylate oligomer. It is fast curing, chemical resistant, and produces strong, flexible films.

4. Physical / Chemical properties

BDDGE diacrylate is a non flammable liquid, partially soluble in water and with low volatility.

Property	Value
Physical state	Liquid at 20°C and 1013.25 hPa
Form	
Particle size	Not applicable
Colour	Yellow
Odour	Characteristic
Molecular weight	346.37 g/mol (main component of the UVCB)

Density	1.1642 g/cm^3 at 20°C
Vapour pressure	1 hPa at 20°C
Freezing / boiling points	-58 °C (glass transition)/ >150°C at 1013 hPa. (decomposition)
Flammability (optional)	Non flammable upon ignition.
Flash point	175°C
Self-ignition temperature	365°C at 1013 hPa
Explosive / oxidizing properties	Not expected based on structure
Water solubility	Partly soluble at 20°C
Dissociation constant (pK_a)	Not applicable
Octanol-water partition coefficient (Log K_{ow})	The Log Kow values are ranged from 0.3 to 2.5 at 23°C

5. Health Effects

BDDGE diacrylate is a moderate skin sensitizer, is irritating to the eyes and harmful if swallowed.

Effect Assessment	Result
Acute Toxicity Oral / inhalation / dermal	Does cause oral acute toxicity. Does not cause acute toxicity after dermal exposure. No data is available by inhalation.
Irritation / corrosion Skin / eye/ respiratory tract	Skin contact does not cause irritation. Eye contact causes serious eye damages.
Sensitisation	Does cause a moderate allergic skin reaction.
Toxicity after repeated exposure Oral / inhalation / dermal	Does cause local irritation in animal studies by oral and dermal routes. However no specific organ toxicity was observed. No data is available by inhalation.
Genotoxicity / Mutagenicity	Based on the available data, not expected to cause genetic effects.
Carcinogenicity	No data is available.
Reproductive / Developmental Toxicology	Based on the available data, does not cause effects on the reproduction or on the foetal development in animal studies.

6. Environmental Effects

BDDGE diacrylate is hydrolytically stable and inherently biodegradable. It is assumed to be also biodegradable in soil and sediments.

Effect Assessment	Result
Aquatic Toxicity	Harmfull to aquatic organisms.

Fate and behaviour	Result
Biodegradation	Inherently biodegradable
Bioaccumulation potential	No bioaccumulation in aquatic organisms expected
PBT / vPvB conclusion	As this substance is not considered to be persistent, it is not classified PBT. This substance is considered to be neither very persistent nor very bioaccumulative (vPvB).

7. Exposure

7.1 Human health

***Workplace exposure*:** Exposure can occur either in a BDDGE diacrylate manufacturing facility or in the various industrial facilities that use the substance. Those working with the substance in industrial operations could be exposed during maintenance, sampling, testing, or other procedures. Each industrial facility should have a thorough training program for employees and appropriate work processes and safety equipment in place to limit unnecessary exposure. Safety showers and eye-wash stations should be accessible nearby. Workers should follow the safety measures recommended in the Extended Safety Data Sheet (eSDS).

7.2 Environment

***Environmental exposure*:** BDDGE diacrylate is used in industrial settings and exposure of the environment is assessed for the manufacture, formulation and use. There are no direct consumer uses for BDDGE diacrylate. Based on the results of risk assessment, all uses are adequately controlled with regard to the environment.

8. Risk Management recommendations

Human health measures	
Eye/Face protection	Safety glasses with side-shields
Skin protection	Long sleeved clothing
Hand protection	Gloves: nitrile rubber > 0,5 mm,(suitable gloves tested to EN374). Replace gloves immediately when torn or any change in appearance (dimension, colour, flexibility, etc) is noticed
Respiratory protection	When using concentrated chemicals always make sure that there is adequate ventilation. In case of insufficient ventilation, wear suitable respiratory equipments.
Organizational measures	Ensure workers are duly trained to minimize exposure
Engineering control	Apply technical measures to comply with the occupational exposure limits When working in confined spaces (tanks, containers, etc.), ensure that there is a supply of air suitable for breathing and wear the recommended equipment

Environmental measures
Do not allow material to contaminate ground water system. All effluent releases that may include the substance must be directed to a (municipal) waste water treatment plant that removes the substance from the final releases to the receiving water.

9. Regulatory Information / Classification and Labelling

9.1 Regulatory Information

This substance has been registered under:

– EU Regulation EC 1907/2006 (REACH)

9.2 Classification and labelling

Under GHS, substances are classified according to their physical, health, and environmental hazards. The hazards are communicated via specific labels and the eSDS. GHS attempts to standardize hazard communication so that the intended audience (workers, consumers, transport workers, and emergency responders) can better understand the hazards of the chemicals in use. Substances registered for REACH are classified according CLP (EC) 1272/2008, implementation of the GHS in the European Union.

Classification	
According to REGULATION (EC) no 1272/2008, the pure substance is classified – Acute Tox. Oral Cat 4 – Eye Damage. Cat 1 – Skin Sens. 1B – Aquatic Chronic Cat 3	
Signal word	
Danger	
Pictogram	
– GHS07: Exclamation mark	
– GHS05: Corrosion	
Hazard statement	
– H302: Harmful if swallowed – H317: May cause an allergic skin reaction. – H318: Causes serious eye damage. – H412: Harmfull to aquatic life with long lasting effects.	
Alternative classification according to Globally Harmonized System (GHS)	
– H302: Harmful if swallowed – H317: May cause an allergic skin reaction. – H318: Causes serious eye damage. – H402: Harmfull to aquatic life – H412: Harmfull to aquatic life with long lasting effects	

10. Contact Information within Company

For further information on this substance or product safety summary in general, please contact:

- **ICCA portal where the GPS Safety Summary is posted**:
  http://www.icca-chem.org/en/Home/ICCA-initiatives/global-product-strategy/

11. Date of Issues / Revision

- Date of issue: 2014/09/30
- Date of revision:

12. Disclaimer

The information contained in this paper is intended as advice only and whilst the information is provided in utmost good faith and has been based on the best information currently available, is to be relied upon at the user's own risk.

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