

GPS Safety Summary

4-Hydroxy-TEMPO

This Product Safety Summary is intended to provide a general overview of the chemical substance in the context of ICCA Global Product Strategy. The information on the summary is basic information and is not intended to provide emergency response information, medical information or treatment information.

Substance name

4-Hydroxy-TEMPO
CAS-No.: 2226-96-2

General statement

4-Hydroxy-TEMPO is used as a polymerization inhibitor in the industrial and professional area. Consumer risk and exposure is very unlikely as 4-hydroxy-TEMPO is manufactured and handled in industrial and professional settings only.

The environmental effects, ecotoxicology and toxicology information available for 4-hydroxy-TEMPO is provided based on studies and/or a reliable evaluation of its hazardous properties.

General and substance specific operational conditions and risk management measures are in place preventing exposure to workers and release to the environment.

Chemical identity

Name	4-hydroxy-2,2,6,6-tetramethylpiperidinoxyl
Brand names	4-OH-TEMPO; 4-Hydroxy-TEMPO
Chemical name (IUPAC)	1-λ1-Oxidanyl-2,2,6,6-tetramethyl-piperidin-4-ol
CAS number	2226-96-2
EC number	218-760-9
Molecular formula	C ₉ H ₁₈ NO ₂

Structure	
Chemical characterization	Hindered Amines
Synonyms	4-Hydroxy-2,2,6,6-tetramethyl-piperidine-N-oxyl; 4-Hydroxy-2,2,6,6-tetramethyl-1-piperidinyloxy; 1-Oxyl-2,2,6,6-tetramethyl-4-hydroxypiperidine

Uses and application

4-Hydroxy-TEMPO is used as a polymerization inhibitor in the industrial and professional field.

Physical/chemical properties

4-Hydroxy-TEMPO is a solid at room temperature. It is an orange solid in shapes of flakes. The substance has a density of 1.127 g/cm³, which is higher than that of water. The substance is not flammable, not auto-ignitable and has no explosive properties. The substance has a melting point of 70 °C and a vapor pressure below 0.01 hPa.

Property	Value
Form(s)	flakes
Physical state	solid
Color	orange
Odor	penetrating
Density	1.127 g/cm ³ (20 °C)
Melting/boiling point	70 °C / n.a. (decomposition > 140 °C)
Explosive properties	non explosive
Auto-ignition temperature	not auto-ignitable
Vapor pressure	<0.01 hPa (20°C)
Molecular weight	172.24 g/mol
Water solubility	629.3 g/l (20 °C)
Flammable solids	not flammable
Octanol-water partition coefficient	Log Pow 0.56 (calculated)
Viscosity	not applicable

Health effects

4-Hydroxy-TEMPO has a moderate acute toxicity by oral and a low toxicity by dermal exposure. The substance causes severe eye damage. 4-Hydroxy-TEMPO is not irritating to the skin, not sensitizing and not mutagenic / clastogenic.

Health effects

Effect Assessment	Result
Acute toxicity (oral, dermal and inhalation)	moderate toxicity after a single ingestion and low toxicity after single skin contact
Irritation/corrosion Skin/eye/respiratory tract	not irritating to the skin, corrosive to the eye
Sensitization	not sensitizing
Mutagenicity / clastogenicity	not mutagenic / not clastogenic
Toxicity after repeated exposure	toxicity after repeated oral doses - target organ specific toxicity in liver and spleen

Environmental effects

Based on available data for the substance, 4-hydroxy-TEMPO is harmful to aquatic organisms with long lasting effects. The product is not readily biodegradable and it has no potential to bioaccumulate.

Environmental effects

Effect Assessment	Result
Aquatic toxicity	harmful to aquatic organism
Fate and Behavior	Result
Biodegradation	not readily biodegradable
Bioaccumulation potential	no bioaccumulation expected
PBT/vPvB conclusion	not considered to be either PBT or vPvB

Exposure

Human health

Worker:

4-Hydroxy-TEMPO is used as a polymerization inhibitor in the industrial and professional field.

Specific operational conditions and risk management measures assure limited workplace exposures. These practices include handling with good ventilation. All workers are trained in the safety measures of handling the substance including using personal protective equipment.

Exposure of the worker has been assessed. The occupational use of this substance is considered to be safe for the worker following the recommended safety measures given in the safety data sheet.

Consumer:

Consumers will not come in contact with 4-Hydroxy-TEMPO.

Environment

The manufacture is a closed and automated process and no exposure to the environment is expected. Exposure to the environment has been assessed. Any exposure from manufacture or use will generally be lower than concern levels.

Risk management recommendations

Avoid dust formation. If dusts are formed: Take precautionary measures against static charges, keep away from sources of ignition. Follow advice on protection against fire and explosion.

Observe the rules usually applicable when handling chemicals.

Wear personal protective equipment.

State agency review

- Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)
- EU REACH registration number: 01-2119968566-20-0000
- EU-GHS Regulation (EU) No. 1272/2008

Regulatory information/classification and labelling

GHS-Labeling

Statutory basis	GHS as per Regulation ST/SG/AC.10/30
Symbol(s)	
Signal word(s)	Danger
Hazard statement(s)	H302 – Harmful if swallowed H318 – Causes serious eye damage H373 – May cause damage to organs through prolonged or repeated exposure H402 – Harmful to aquatic life
Precautionary statement(s)	P260 – Do not breathe dust/fume/gas/mist/vapours/spray.

	<p>P280 – Wear protective gloves/ protective clothing/eye protection/face protection.</p> <p>P305+P351+P338 – IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.</p> <p>P314 – Get medical advice/attention if you feel unwell.</p> <p>P501 – Dispose of contents/container in accordance with local regulation.</p>
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Glossary

Acute toxicity	harmful effects after a single exposure
Biodegradable	breakdown of materials by a physiological environment
Bioaccumulation	accumulation of substances in the environment
Carcinogenicity	effects causing cancer
Chronic toxicity	harmful effects after repeated exposures
GHS	Global Harmonized System on Classification and Labelling of Chemicals
Mutagenicity	effects that change genes
PBT	persistent, bioaccumulative and toxic
REACH	Registration, Evaluation and Authorisation of Chemicals
Reprotoxicity	combining teratogenicity, embryo toxicity and harmful effects on fertility
Sensitizing	allergenic
Teratogenic	effects on fetal morphology

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Performance of the chemical described herein should be verified by testing which should be carried out only by qualified experts.

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