



Hydroquinone

Chemical Identity

<i>Brand names</i>	Hydroquinone	<i>CAS number</i>	123-31-9
<i>Chemical name (IUPAC)</i>	benzene-1,4-diol	<i>Molecular formula</i>	C₆H₆O₂
<i>Synonyms</i>	Para-hydroxyphenol; 1,4-dihydroxybenzol; 1,4-dihydroxybenzene; para-dihydroxybenzene; p-benzenediol	<i>Molecular weight</i>	110 g/mol

Applications

Hydroquinone is used in industry, mainly to stabilize monomers, preventing the polymerisation process. It is efficient in the monomer production process as well as in monomer storage and transport.

Safety Assessment, Exposure and Risk Management Recommendations

Physical and Chemical properties

Property	Result
Physical state	Crystalline solid
Colour	White
Odour	Odourless
Melting point	172°C
Boiling point	287°C
Flammability	Non flammable
Water solubility	Very soluble
Octanol water partition	Low potential for bioaccumulation

Health effect



Hydroquinone causes serious eye irritation and is harmful if swallowed. It may cause allergic skin reaction and it is suspected of causing genetic defects and cancer.

Stringent safety measures must be respected for industrial uses, for more details, please refer to the Safety Data Sheet.

Environmental effect



Hydroquinone is very toxic to aquatic life. Disposal, treatment or recycling must comply with applicable regulations to preserve the environment.

Regulatory information and certifications

Classification and labelling

EU regulation (EC) 1272/2008 (CLP)

	Eye Dam. 1	H318 Causes serious eye damage
	Acute Tox. 4	H302 Harmful if swallowed
	Skin Sens 1	H317 May cause an allergic skin reaction
	Muta. 2	H341 Suspected of causing genetic defects
	Carc. 2	H351 Suspected of causing cancer
	Aqu. Acute 1	H400 Very toxic to aquatic life

Danger

Registration and certification

ISO 9001: 2008 certified
EU regulation on chemicals (EC) 1907/2006 (REACH)

GPS Safety Summary

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. The summary should not be used to provide in-depth safety and health information. In-depth safety and health information can be found on the (extended) Safety Data Sheet (e)SDS for the chemical substance.

Hydroquinone

General Statement

Hydroquinone is an aromatic compound derived from phenol. It is a crystalline powder. It is well-known for its antioxidant properties and is widely used as a stabilizer in the coating industry.

Hydroquinone pure substance may cause severe damages to human health: it is an eye irritant and a possible skin sensitizer and it is harmful if swallowed. It is suspected to cause genetic defects and cancer. Hydroquinone is also very toxic to aquatic life.

The pure substance is used in a large number of industrial and professional applications. It must be handled under stringent safety conditions in accordance with risk management measures to control the risk of exposure and to preserve human health and environment.

In consumer end-use products, hydroquinone is formulated in suitable concentrations, according to appropriate regulations, to ensure safe use of the final product in the conditions of use written on the product packaging.

Chemical Identity

Name:	Hydroquinone
Brand names:	Hydroquinone (Extra Pure, Premium, Premium Flakes)
Chemical name (IUPAC):	Benzene-1,4-diol
Synonyms:	Para-hydroxyphenol; 1,4-dihydroxybenzol; 1,4-dihydroxybenzene; para-dihydroxybenzene; p-benzenediol
CAS number:	123-31-9
EC number:	204-617-8
Molecular formula:	C ₆ H ₆ O ₂

Structure:



Uses and applications

Hydroquinone is an aromatic organic compound, white granular solid, synthesized from phenol. It is well-known for its antioxidant properties and is used in industry, mainly as an inhibitor of polymerisation for monomers in petrochemical industry (for process, transport and storage stabilization). It is also a stabilizer for the formulation of inks, coatings, rubbers and polymers. Hydroquinone is also used as a chemical intermediate for synthesis of pharmaceuticals, chemicals and agrochemicals. Furthermore it is used in photographic processing for industrial, professional and consumer use. Some uses (cosmetics, bleaching agent) are regulated or prohibited, relevant European or national regulation has to be taken into account.

Physical/Chemical Properties

Phys/Chem Safety Assessment

Property	Value
Physical state	Crystalline solid at 20°C
Form	Powder
Colour	White
Odour	Odourless
Molecular weight	110.11 g/mol
Melting Point	172.3°C
Boiling Point	287°C
Flash point	165°C at atmospheric pressure (closed cup)
Flammability	Not highly flammable
Explosive properties	No explosive properties
Self-ignition temperature	515°C at atmospheric pressure
Vapour pressure	0.003 Pa at 20°C, no potential for volatilisation
Water solubility	72 g/l at 25°C, very soluble
Octanol Water partition coefficient (log Kow)	0.59 at 20°C, low potential for bioaccumulation

Regarding physical and chemical hazards, hydroquinone is not classified according to regulation (EC) 1272/2008.

Health Effects

Human Health Safety Assessment

Effect Assessment	Result
Acute Toxicity Oral/inhalation/dermal	Harmful if swallowed Conclusive data and not classified for dermal route No data for inhalation route
Irritation / corrosion Skin/eye	Conclusive data and not classified for skin irritation Causes serious eye damage
Sensitisation	May cause an allergic skin reaction
Toxicity after repeated exposure Oral/inhalation/dermal	Conclusive data and not classified for repeated toxicity based on oral and dermal data
Genotoxicity / Mutagenicity	Suspected of causing genetic defects, based on <i>in vitro</i> and <i>in vivo</i> studies results and mutagenic effects (<i>in vitro</i> results)
Carcinogenicity	Suspected of causing cancer, based on several animal oral data
Toxicity for reproduction	No effect on fertility and no developmental toxicity, based on animal oral data

All these results are based on available data. Hydroquinone is classified as hazardous for health according to EC 1272/2008 regulation.

Environmental Effects

Environment Safety Assessment

Effect Assessment	Result
Aquatic Toxicity	Very toxic to fish, algae and invertebrates

Fate and behaviour	Result
Biodegradation	Readily biodegradable
Bioaccumulation potential	Not potentially bioaccumulative (log Kow = 0.59)
PBT / vPvB conclusion	Not considered to be either PBT or vPvB

Based on available data, hydroquinone is classified as very toxic to aquatic life according to EC 1272/2008 regulation.

Hydroquinone is readily biodegradable and not potentially bioaccumulative, so it is not considered to be either PBT or vPvB.

Exposure

Considering the hydroquinone lifecycle, human and environment risk of exposure is assessed from manufacture to end-use product applications.

Hydroquinone pure substance may cause severe damages to human health: it is eye irritating and a possible skin sensitizer and it is harmful if swallowed. It is suspected to cause chronic damages: genetic defects and cancer.

Hydroquinone is classified as very toxic to aquatic life.

Frequent and direct contact with the pure substance is strictly avoided. Manual phases are minimized and the substance is handled under stringent safety conditions in accordance with the risk management measures to control the risk of exposure and to preserve human health and environment.

Human health

On industrial site, manufacturing operations are as much as possible enclosed (synthesis in closed process, sampling via closed loop, closed transfer lines, ...) which ensures that the risk is controlled.

However, when workers might come in contact with the pure or formulated substance, during (un)loading, mixing, sampling, analysis or maintenance operations, the exposure is kept as low as possible and at a safe level (strictly below occupational exposure limits) by the use of appropriate risk management measures.

Consumer exposure to formulated hydroquinone in specific use (photo developer) is at a safe level when appropriate protective measures are observed, in line with the conditions of use written on the product packaging.

Environment

Hydroquinone is readily biodegradable.

In addition, hydroquinone has a very low potential for adsorption, bioaccumulation and volatilisation.

Based on its physical and chemical properties, if hydroquinone was released into the environment, it would be mainly distributed in water and would not be persistent. No release in the soil and atmospheric compartment is expected.

All effluent releases that may contain the substance are directed to a waste water treatment plant that removes the substance from the final releases to the receiving water.

An indirect exposure of humans via the environment is not expected for hydroquinone.

Risk Management Recommendations

Human health

For industrial uses of hydroquinone substance, workers must be well informed and trained and must refer to the extended Safety Data Sheet (eSDS). In order to control possible risks during the handling of the substance (during (un)loading, mixing, sampling, analysis or maintenance operations), the substance must be handled within a predominantly closed system provided with extract ventilation. Where this is not possible, handling must be under an effective exhaust ventilation system, appropriate personal protective equipment must be worn (safety goggles, gloves, protective suit) as hydroquinone is eye irritating and may cause an allergic skin reaction. The ventilation system must be regularly maintained and tested.

In case of dust, aerosol or vapour formation, wearing a respirator with approved filter is recommended.

In case of handling molten hydroquinone, face-shield, full protective suit, long-sleeve gloves must be worn. Hygiene measures must be respected (accessible emergency equipment, well-maintained PPE, avoid dust formation, wash hands and skin following contact, do not eat, drink or smoke on the workplace).

For private uses of product containing hydroquinone (photographic chemicals), consumers must refer to the product SDS and to the conditions of use written on the product packaging. Appropriate safety glasses and gloves must be worn when mixing chemicals and good hygiene measures must be respected.

Environment

Hydroquinone is mainly distributed in water. On the manufacturing site, aqueous releases that may contain the substance are directed to a biological sewage treatment plant. In order to ensure an adequate control of the risk for the aquatic compartment, the concentration of hydroquinone before and after treatment must respect stringent limit values.

For the industrial uses of hydroquinone as intermediate in pharmaceutical industry and as polymerisation inhibitor in petrochemical industry, the waste water has to reach a waste water treatment plant to avoid releases in the effluent.

For the professional and consumer uses of hydroquinone, aqueous releases have to be directed to a (municipal) waste water treatment plant.

Disposal, treatment or recycling of industrial waste must comply with applicable regulations to preserve the environment.

State Agency Review

Hydroquinone has been registered under: EU regulation (EC) 1907/2006 (REACH)

Hydroquinone has been reviewed under the following regulatory and/or voluntary programmes: OECD list of High Production Volume chemicals: UNEP publication in 2002

Regulatory Information / Classification and Labelling

Substance classification and labelling according to EU regulation (EC) 1272/2008 (CLP):

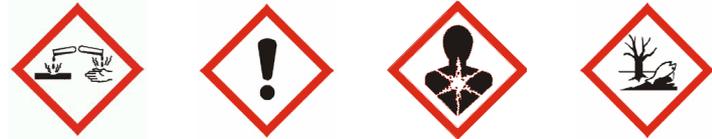
Classification

Acute toxicity, Oral, Category 4
Skin sensitization, Category 1
Serious eye damage, Category 1
Germ cell mutagenicity, Category 2
Carcinogenicity, Category 2
Acute aquatic toxicity, Category 1

H302 Harmful if swallowed.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H341 Suspected of causing genetic defects.
H351 Suspected of causing cancer.
H400 Very toxic to aquatic life.

Labelling

Pictogram:



Signal word:

Danger

Hazard statements:

H302 Harmful if swallowed.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H341 Suspected of causing genetic defects.
H351 Suspected of causing cancer.
H400 Very toxic to aquatic life.

Precautionary statements:

[P102 Keep out of reach of children.]
P201 Obtain special instructions before use.
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P273 Avoid release to the environment.
P280 Wear protective gloves/ eye protection/ face protection.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 Immediately call a POISON CENTER or doctor/ physician.

Contact information within company

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

Rhodia Global product Strategy: http://www.rhodia.com/en/sustainability/global_product_strategy/index.tcm

Contact: globalproductstrategy@eu.rhodia.com

Additional information

ICCA Global Product Strategy: <http://www.icca-chem.org/en/Home/ICCA-initiatives/global-product-strategy/>

(extended) Safety Data Sheet available on demand: http://www.rhodia.com/en/contact/contact_form_business.tcm

Glossary of technical terms: http://www.rhodia.com/en/sustainability/global_product_strategy/glossary/index.tcm

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Disclaimer

The information provided in the present Safety Summary is based on European data available in REACH regulatory dossier (EC N°1907/2006) and is correct to the best of our knowledge, information and belief at the date of its publication. Such information is only intended to provide a general overview of the chemical substance in the context of ICCA Global Product Strategy and is not to be considered as a warranty or quality specification. It does not replace the safety data sheet and technical sheets. Thus, the information provided in this Safety Summary only relates to the designated specific product and may not be applicable if such product is used in combination with other materials or in another manufacturing process, unless otherwise specifically indicated. It does not release the user from ensuring he is in conformity with all regulations linked to its activity.