

Material Safety Data Sheet

Date Printed: 15/DEC/2004

Date Updated: 13/MAR/2004

Version 1.2

According to 91/155/EEC

1 - Product and Company Information

Product Name	HYDROQUINONE EXTRA PURE
Product Number	15616
Company	Sigma-Aldrich Pte Ltd #08-01 Citilink Warehouse Singapore 118529 Singapore
Technical Phone #	65 271 1089
Fax	65 271 1571

2 - Composition/Information on Ingredients

Product Name	CAS #	EC no	Annex I Index Number
HYDROQUINONE	123-31-9	204-617-8	604-005-00-4

Formula	C6H6O2
Molecular Weight	110.11 AMU
Synonyms	Arctuin * Benzene, p-dihydroxy- * p-Benzenediol * 1,4-Benzenediol * Benzohydroquinone * Benzoquinol * Black and white bleaching cream * 1,4-Dihydroxy-benzen (Dutch) * 1,4-Dihydroxybenzen (Czech) * Dihydroxybenzene * p-Dihydroxybenzene * 1,4-Dihydroxybenzene * Dihydroxybenzene (OSHA) * 1,4-Dihydroxy-benzol (German) * 1,4-Diidrobenzene (Italian) * p-Dioxobenzene * p-Dioxybenzene * Eldopaque * Eldoquin * Hydrochinon (Czech, Polish) * Hydroquinol * Hydroquinole * alpha-Hydroquinone * p-Hydroquinone * Hydroquinone (ACGIH:OSHA) * p-Hydroxyphenol * Idrochinone (Italian) * NCI-C55834 * Phiaquin * Pyrogentic acid * Quinol * beta-Quinol * Tecquinol * Tenox HQ * Tequinol * USAF EK-356

3 - Hazards Identification

SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT

Harmful if swallowed. Limited evidence of a carcinogenic effect.
Risk of serious damage to eyes. May cause sensitization by skin
contact. Very toxic to aquatic organisms. Possible risk of
irreversible effects.
Carc. Cat.3 Muta. Cat.3

4 - First Aid Measures

AFTER INHALATION

If inhaled, remove to fresh air. If not breathing give
artificial respiration. If breathing is difficult, give oxygen.

AFTER SKIN CONTACT

In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

AFTER EYE CONTACT

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

AFTER INGESTION

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

5 - Fire Fighting Measures

EXTINGUISHING MEDIA

Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

SPECIAL RISKS

Specific Hazard(s): Emits toxic fumes under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

6 - Accidental Release Measures

PERSONAL PRECAUTION PROCEDURES TO BE FOLLOWED IN CASE OF LEAK OR SPILL
Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear respirator, chemical safety goggles, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP

Sweep up, place in a bag and hold for waste disposal. Avoid raising dust. Ventilate area and wash spill site after material pickup is complete.

7 - Handling and Storage

HANDLING

Directions for Safe Handling: Do not breathe dust. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

STORAGE

Conditions of Storage: Keep tightly closed.

SPECIAL REQUIREMENTS: Air and light sensitive.

8 - Exposure Controls / Personal Protection

ENGINEERING CONTROLS

Safety shower and eye bath. Mechanical exhaust required.

GENERAL HYGIENE MEASURES

Wash thoroughly after handling.

EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	2 MG/M3
Poland		NDSCh	4 MG/M3
Poland		NDSP	-

EXPOSURE LIMITS - DENMARK

Source	Type	Value
OEL	TWA	2 mg/m3

Remarks: L

EXPOSURE LIMITS - GERMANY

Source	Type	Value
TRGS 900	OEL	2 mg/m3, E

Remarks: =1=

EXPOSURE LIMITS - NORWAY

Source	Type	Value
	OEL	0.5 mg/m3

Remarks: KA

EXPOSURE LIMITS - SWEDEN

Source	Type	Value
	LLV (Level)	0.5 mg/m3

Remarks: S

EXPOSURE LIMITS - SWITZERLAND

Source	Type	Value
OEL	OEL	2 mg/m3

Remarks: E D

EXPOSURE LIMITS - UNITED KINGDOM

Source	Type	Value
OEL	OEL	2 mg/m3
OEL	STEL	4 mg/m3

Remarks: Chemical Hazard Alert Notice Indicative limit

PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection: Government approved respirator.
 Hand Protection: Compatible chemical-resistant gloves.
 Eye Protection: Chemical safety goggles.

9 - Physical and Chemical Properties

Appearance	Physical State: Solid Color: Colorless Form: Fine crystals	
Property	Value	At Temperature or Pressure
pH	3.7	Concentration: 70 g/l
BP/BP Range	285 °C	760 mmHg
MP/MP Range	171 °C	
Flash Point	N/A	
Flammability	N/A	
Autoignition Temp	499 °C	
Oxidizing Properties	N/A	
Explosive Properties	N/A	
Explosion Limits	N/A	
Vapor Pressure	1 mmHg	132 °C
SG/Density	1.332 g/cm3	
Partition Coefficient	Log Kow: 0.59	
Viscosity	N/A	

Vapor Density	3.81 g/l
Saturated Vapor Conc.	N/A
Evaporation Rate	N/A
Bulk Density	550 - 650 kg/l
Decomposition Temp.	N/A
Solvent Content	N/A
Water Content	N/A
Surface Tension	N/A
Conductivity	N/A
Miscellaneous Data	N/A
Solubility	Solubility in Water:50 mg/ml H2O Clear

10 - Stability and Reactivity

STABILITY

Stable: Stable.

Conditions to Avoid: Light. Air.

Materials to Avoid: Strong bases, Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

11 - Toxicological Information

RTECS NUMBER: MX3500000

ACUTE TOXICITY

LDLO

Oral

Human

29 mg/kg

LD50

Oral

Rat

302 mg/kg

LD50

Intraperitoneal

Rat

170 MG/KG

LD50

Intravenous

Rat

115 MG/KG

Remarks: Behavioral:Tremor. Behavioral:Convulsions or effect on seizure threshold. Behavioral:Excitement.

LD50

Oral

Mouse

245 mg/kg

LD50

Intraperitoneal

Mouse

100 MG/KG

LD50
Subcutaneous
Mouse
182 MG/KG

LD50
Oral
Dog
200 mg/kg
Remarks: Behavioral:Convulsions or effect on seizure threshold.
Behavioral:Excitement. Gastrointestinal:Nausea or vomiting.

LD50
Oral
Cat
50 mg/kg

LD50
Oral
Rabbit
200 mg/kg

LD50
Intraperitoneal
Rabbit
125 MG/KG

LD50
Oral
Guinea pig
550 mg/kg
Remarks: Behavioral:Tremor. Behavioral:Convulsions or effect on
seizure threshold. Behavioral:Excitement.

LD50
Oral
Pigeon
300 mg/kg
Remarks: Behavioral:Convulsions or effect on seizure threshold.
Behavioral:Excitement. Gastrointestinal:Nausea or vomiting.

LD50
Oral
Mammal
480 mg/kg
Remarks: Behavioral:Change in motor activity (specific assay).
Behavioral:Muscle contraction or spasticity. Lungs, Thorax, or
Respiration:Dyspnea.

LD50
Skin
Mammal
5970 mg/kg

IRRITATION DATA

Skin
Human
2 %
Remarks: Mild irritation effect

Skin
Human
5 %
Remarks: Severe irritation effect

SENSITIZATION

Skin: May cause allergic skin reaction.

SIGNS AND SYMPTOMS OF EXPOSURE

Absorption into the body leads to the formation of methemoglobin which in sufficient concentration causes cyanosis. Onset may be delayed 2 to 4 hours or longer.

ROUTE OF EXPOSURE

Skin Contact: Causes skin irritation.
Skin Absorption: May be harmful if absorbed through the skin.
Eye Contact: Causes severe eye irritation.
Inhalation: May be harmful if inhaled. Material may be irritating to mucous membranes and upper respiratory tract.
Ingestion: Harmful if swallowed.

TARGET ORGAN INFORMATION

Blood. Liver. Kidneys. Eyes.

CHRONIC EXPOSURE - CARCINOGEN

Result: This product is or contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, or EPA classification.

Rat

Route of Application: Oral
Exposure Time: 2Y
Result: Tumorigenic: Carcinogenic by RTECS criteria. Kidney, Ureter, Bladder: Kidney tumors.

Mouse

Route of Application: Oral
Exposure Time: 2Y
Result: Tumorigenic: Neoplastic by RTECS criteria. Liver: Tumors.

Rat

Route of Application: Oral
Exposure Time: 2Y
Result: Tumorigenic: Neoplastic by RTECS criteria. Kidney, Ureter, Bladder: Kidney tumors.

Rat

Route of Application: Oral
Exposure Time: 2Y
Result: Tumorigenic: Neoplastic by RTECS criteria. Kidney, Ureter, Bladder: Kidney tumors.

Mouse

Route of Application: Oral
Exposure Time: 2Y
Result: Tumorigenic: Neoplastic by RTECS criteria. Liver: Tumors.

Mouse

Route of Application: Oral
Exposure Time: 2Y
Result: Tumorigenic: Carcinogenic by RTECS criteria. Liver: Tumors.

IARC CARCINOGEN LIST

Rating: Group 3

CHRONIC EXPOSURE - MUTAGEN

Result: Laboratory experiments have shown mutagenic effects.

Human

75 UMOL/L

Cell Type: lymphocyte

Micronucleus test

Human

500 UMOL/L

Cell Type: Bone marrow

DNA

Human

800 UMOL/L

Cell Type: lung

DNA damage

Human

100 UMOL/L

Cell Type: lymphocyte

DNA damage

Human

100 UMOL/L

Cell Type: HeLa cell

DNA inhibition

Human

5 UMOL/L

Cell Type: lymphocyte

Other mutation test systems

Human

5 UMOL/L

Cell Type: lymphocyte

Sister chromatid exchange

Human

6 MG/L

Cell Type: lymphocyte

SLN

Human

75 UMOL/L

Cell Type: lymphocyte

SLN

Rat

400 UMOL/L

Cell Type: liver

DNA damage

Rat

8 GM/KG

Oral

Unscheduled DNA synthesis

Mouse
20 MG/KG
Intraperitoneal
Micronucleus test

Mouse
240 MG/KG
Subcutaneous
6D
Micronucleus test

Mouse
80 MG/KG
Oral
Micronucleus test

Mouse
2500 UG/L (+S9)
Cell Type: lymphocyte
Mutation in microorganisms

Mouse
120 MG/KG
Oral
Other mutation test systems

Mouse
10 UMOL/L
Cell Type: lymphocyte
DNA inhibition

Mouse
10 UMOL/L
Cell Type: lymphocyte
Other mutation test systems

Mouse
25 UMOL/L
Cell Type: Other cell types
Other mutation test systems

Mouse
40 MG/KG
Intraperitoneal
Cytogenetic analysis

Mouse
80 MG/KG
Intraperitoneal
SLN

Mouse
1250 UG/L
Cell Type: lymphocyte
Mutation in mammalian somatic cells.

Hamster
17500 NMOL/L
Cell Type: lung
Micronucleus test

Hamster

3 UMOL/L
Cell Type: Embryo
Morphological transformation.

Hamster
1 UMOL/L
Cell Type: Embryo
Unscheduled DNA synthesis

Hamster
500 UMOL/L
Cell Type: lung
DNA inhibition

Hamster
2 MG/L
Cell Type: Embryo
Other mutation test systems

Hamster
20 MG/L
Cell Type: ovary
Cytogenetic analysis

Hamster
30 UMOL/L
Cell Type: Embryo
Cytogenetic analysis

Hamster
1 UMOL/L
Cell Type: Embryo
Sister chromatid exchange

Hamster
500 UG/L
Cell Type: ovary
Sister chromatid exchange

Hamster
20 UMOL/L
Cell Type: lung
Sister chromatid exchange

Hamster
1250 UG/L
Cell Type: Embryo
SLN

Hamster
10 UMOL/L
Cell Type: Embryo
Mutation in mammalian somatic cells.

Rabbit
6 UMOL/L
Cell Type: Bone marrow
Other mutation test systems

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Rat

Dose: 2500 MG/KG
Route of Application: Oral
Exposure Time: (1-22D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Rat
Dose: 667 MG/KG
Route of Application: Oral
Exposure Time: (11D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Rat
Dose: 1 GM/KG
Route of Application: Oral
Exposure Time: (11D PREG)
Result: Effects on Fertility: Litter size (e.g.; # fetuses per litter; measured before birth).

Species: Rat
Dose: 5 MG/KG
Route of Application: Subcutaneous
Exposure Time: (1D PRE)
Result: Maternal Effects: Ovaries, fallopian tubes.

Species: Rat
Dose: 550 MG/KG
Route of Application: Subcutaneous
Exposure Time: (11D PRE)
Result: Maternal Effects: Menstrual cycle changes or disorders.

Species: Rat
Dose: 5100 MG/KG
Route of Application: Subcutaneous
Exposure Time: (51D MALE)
Result: Paternal Effects: Testes, epididymis, sperm duct.
Paternal Effects: Prostate, seminal vessicle, Cowper's gland, accessory glands. Effects on Fertility: Male fertility index (e.g., # males impregnating females per # males exposed to fertile nonpregnant females).

12 - Ecological Information

ECOTOXICOLOGICAL EFFECTS

Test Type: EC50 Algae
Time: 24 h
Value: 17 mg/l

Test Type: EC50 Daphnia
Species: Daphnia magna
Time: 24 h
Value: 0.12 mg/l

Test Type: LC50 Fish
Species: Leuciscus idus
Time: 48 h
Value: 0.15 mg/l

Test Type: LC50 Fish
Species: Onchorhynchus mykiss (Rainbow trout)

Time: 96 h
Value: 0.04 - 0.1 mg/l

13 - Disposal Considerations

SUBSTANCE DISPOSAL

Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

14 - Transport Information

RID/ADR

UN#: 2662
Class: 6.1
PG: III
Proper Shipping Name: Hydroquinone

IMDG

UN#: 2662
Class: 6.1
PG: III
Proper Shipping Name: HYDROQUINONE, SOLID
Marine Pollutant: No
Severe Marine Pollutant: No

IATA

UN#: 2662
Class: 6.1
PG: III
Proper Shipping Name: Hydroquinone
Inhalation Packing Group I: No

15 - Regulatory Information

CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES

ANNEX I INDEX NUMBER: 604-005-00-4

INDICATION OF DANGER: Xn N

Harmful. Dangerous for the environment.

R-PHRASES: 22 40 41 43 50 68

Harmful if swallowed. Limited evidence of a carcinogenic effect. Risk of serious damage to eyes. May cause sensitization by skin contact. Very toxic to aquatic organisms. Possible risk of irreversible effects.

S-PHRASES: 26 36/37/39 61

In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves, and eye/face protection. Avoid release to the environment. Refer to special instructions/safety data sheets.

COUNTRY SPECIFIC INFORMATION

Germany

WGK: 3

SWITZERLAND

SWISS POISON CLASS: 3

16 - Other Information

WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2004 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

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