

## MATERIAL SAFETY DATA SHEET

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Version 1.5

## Section 1 - Product and Company Information

Product Name HYDROQUINONE, 99+%

Product Number 240125

Brand ALDRICH

Company Sigma-Aldrich

Street Address 3050 Spruce Street

City, State, Zip, Country SAINT LOUIS MO 63103 US

Technical Phone: 314 771 5765

Emergency Phone: 414 273 3850 Ext. 5996

Fax: 800 325 5052

## Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
HYDROQUINONE	123-31-9	Yes

Formula C6H6O2

Synonyms Arctuvín \* 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

RTECS Number: MX3500000

## Section 3 - Hazards Identification

## EMERGENCY OVERVIEW

Toxic (USA) Harmful (EU). Dangerous for the environment. Harmful if swallowed. Irritating to skin. Limited evidence of a carcinogenic effect. Risk of serious damage to eyes. May cause sensitization by skin contact. Very toxic to aquatic organisms. Possible Carcinogen (US). Possible mutagen. Target organ(s): Blood. Liver.

## HMIS RATING

HEALTH: 3\*

FLAMMABILITY: 0

REACTIVITY: 1

## NFPA RATING

HEALTH: 3  
FLAMMABILITY: 0  
REACTIVITY: 1

\*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

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#### Section 4 - First Aid Measures

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##### ORAL EXPOSURE

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

##### INHALATION EXPOSURE

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

##### DERMAL EXPOSURE

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

##### EYE EXPOSURE

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.

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#### Section 5 - Fire Fighting Measures

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##### FLASH POINT

N/A

##### AUTOIGNITION TEMP

499 °C

##### FLAMMABILITY

N/A

##### EXTINGUISHING MEDIA

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

##### FIREFIGHTING

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.  
Specific Hazard(s): Emits toxic fumes under fire conditions.

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#### Section 6 - Accidental Release Measures

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##### PROCEDURE 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.

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Section 7 - Handling and Storage

HANDLING

User Exposure: Do not breathe dust. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

STORAGE

Suitable: Keep tightly closed.

SPECIAL REQUIREMENTS

Air and light sensitive.

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS

Safety shower and eye bath. Mechanical exhaust required.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory: Government approved respirator.

Hand: Compatible chemical-resistant gloves.

Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES

Wash thoroughly after handling.

EXPOSURE LIMITS, RTECS

Country	Source	Type	Value
USA	ACGIH	TWA	2 MG/M3
USA	MSHA Standard-air	TWA	2 MG/M3
USA	OSHA.	PEL	8H TWA 2 MG/M3
New Zealand	OEL		
Remarks:	check ACGIH TLV		
USA	NIOSH	Ceiling co2	MG/M3/15M

EXPOSURE LIMITS

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

Section 9 - Physical/Chemical Properties

Appearance	Physical State: Solid	
	Color: Colorless	
	Form: Fine crystals	
Property	Value	At Temperature or Pressure
Molecular Weight	110.11 AMU	
pH	3.7	Concentration: 70 g/l
BP/BP Range	285 °C	760 mmHg
MP/MP Range	171 °C	
Freezing Point	N/A	
Vapor Pressure	1 mmHg	132 °C
Vapor Density	3.81 g/l	
Saturated Vapor Conc.	N/A	
SG/Density	1.332 g/cm <sup>3</sup>	
Bulk Density	550 - 650 kg/l	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	N/A	

Solvent Content	N/A
Evaporation Rate	N/A
Viscosity	N/A
Surface Tension	N/A
Partition Coefficient	Log Kow: 0.59
Decomposition Temp.	N/A
Flash Point	N/A
Explosion Limits	N/A
Flammability	N/A
Autoignition Temp	499 °C
Refractive Index	N/A
Optical Rotation	N/A
Miscellaneous Data	N/A
Solubility	Solubility in Water:50 mg/ml H2O Clear

N/A = not available

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## Section 10 - Stability and Reactivity

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### STABILITY

Stable: Stable.

Conditions to Avoid: Sensitive to air. Sensitive to light.

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

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## Section 11 - Toxicological Information

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### 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.

### SENSITIZATION

Skin: May cause allergic skin reaction.

### TARGET ORGAN(S) OR SYSTEM(S)

Blood. Liver. Kidneys. Eyes.

### 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.

### TOXICITY DATA

Oral  
Human  
29 mg/kg  
LDLO

Oral  
Rat  
302 mg/kg  
LD50

Intraperitoneal  
Rat  
170 MG/KG  
LD50

Intravenous  
Rat  
115 MG/KG  
LD50

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

Oral  
Mouse  
245 mg/kg  
LD50

Intraperitoneal  
Mouse  
100 MG/KG  
LD50

Subcutaneous  
Mouse  
182 MG/KG  
LD50

Oral  
Dog  
200 mg/kg  
LD50

Remarks: Behavioral:Convulsions or effect on seizure threshold. Behavioral:Excitement. Gastrointestinal:Nausea or vomiting.

Oral  
Cat  
50 mg/kg  
LD50

Oral  
Rabbit  
200 mg/kg  
LD50

Intraperitoneal  
Rabbit  
125 MG/KG  
LD50

Oral  
Guinea pig  
550 mg/kg  
LD50

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

Oral  
Pigeon  
300 mg/kg  
LD50

Remarks: Behavioral:Convulsions or effect on seizure threshold.

Behavioral:Excitement. Gastrointestinal:Nausea or vomiting.

Oral

Mammal

480 mg/kg

LD50

Remarks: Behavioral:Change in motor activity (specific assay). Behavioral:Muscle contraction or spasticity. Lungs, Thorax, or Respiration:Dyspnea.

Skin

Mammal

5970 mg/kg

LD50

#### IRRITATION DATA

Skin

Human

2 %

Remarks: Mild irritation effect

Skin

Human

5 %

Remarks: Severe irritation effect

#### 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.

Species: Rat

Route of Application: Oral

Dose: 25750 MG/KG

Exposure Time: 2Y

Frequency: C

Result: Tumorigenic:Carcinogenic by RTECS criteria. Kidney, Ureter, Bladder:Kidney tumors.

Species: Mouse

Route of Application: Oral

Dose: 25750 MG/KG

Exposure Time: 2Y

Frequency: C

Result: Tumorigenic:Neoplastic by RTECS criteria. Liver:Tumors.

Species: Rat

Route of Application: Oral

Dose: 256 GM/KG

Exposure Time: 2Y

Frequency: C

Result: Tumorigenic:Neoplastic by RTECS criteria. Kidney, Ureter, Bladder:Kidney tumors.

Species: Rat

Route of Application: Oral

Dose: 349 GM/KG

Exposure Time: 2Y

Frequency: C

Result: Tumorigenic:Neoplastic by RTECS criteria. Kidney, Ureter, Bladder:Kidney tumors.

Species: Mouse  
Route of Application: Oral  
Dose: 699 GM/KG  
Exposure Time: 2Y  
Frequency: C  
Result: Tumorigenic:Neoplastic by RTECS criteria. Liver:Tumors.

Species: Mouse  
Route of Application: Oral  
Dose: 26 GM/KG  
Exposure Time: 2Y  
Frequency: I  
Result: Tumorigenic:Carcinogenic by RTECS criteria. Liver:Tumors.

#### IARC CARCINOGEN LIST

Rating: Group 3

#### NTP CARCINOGEN LIST

Rating: Some evidence.  
Species: Mouse/rat  
Route: Gavage

#### CHRONIC EXPOSURE - MUTAGEN

Result: Laboratory experiments have shown mutagenic effects.

Species: Human  
Dose: 75 UMOL/L  
Cell Type: lymphocyte  
Mutation test: Micronucleus test

Species: Human  
Dose: 500 UMOL/L  
Cell Type: Bone marrow  
Mutation test: DNA

Species: Human  
Dose: 800 UMOL/L  
Cell Type: lung  
Mutation test: DNA damage

Species: Human  
Dose: 100 UMOL/L  
Cell Type: lymphocyte  
Mutation test: DNA damage

Species: Human  
Dose: 100 UMOL/L  
Cell Type: HeLa cell  
Mutation test: DNA inhibition

Species: Human  
Dose: 5 UMOL/L  
Cell Type: lymphocyte  
Mutation test: Other mutation test systems

Species: Human  
Dose: 5 UMOL/L  
Cell Type: lymphocyte  
Mutation test: Sister chromatid exchange

Species: Human  
Dose: 6 MG/L  
Cell Type: lymphocyte  
Mutation test: SLN

Species: Human  
Dose: 75 UMOL/L  
Cell Type: lymphocyte  
Mutation test: SLN

Species: Rat  
Dose: 400 UMOL/L  
Cell Type: liver  
Mutation test: DNA damage

Species: Rat  
Route: Oral  
Dose: 8 GM/KG  
Mutation test: Unscheduled DNA synthesis

Species: Mouse  
Route: Intraperitoneal  
Dose: 20 MG/KG  
Mutation test: Micronucleus test

Species: Mouse  
Route: Subcutaneous  
Dose: 240 MG/KG  
Exposure Time: 6D  
Mutation test: Micronucleus test

Species: Mouse  
Route: Oral  
Dose: 80 MG/KG  
Mutation test: Micronucleus test

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

Species: Mouse  
Route: Oral  
Dose: 120 MG/KG  
Mutation test: Other mutation test systems

Species: Mouse  
Dose: 10 UMOL/L  
Cell Type: lymphocyte  
Mutation test: DNA inhibition

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

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



Species: Mouse  
Route: Intraperitoneal  
Dose: 40 MG/KG  
Mutation test: Cytogenetic analysis

Species: Mouse  
Route: Intraperitoneal  
Dose: 80 MG/KG  
Mutation test: SLN

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

Species: Hamster  
Dose: 17500 NMOL/L  
Cell Type: lung  
Mutation test: Micronucleus test

Species: Hamster  
Dose: 3 UMOL/L  
Cell Type: Embryo  
Mutation test: Morphological transformation.

Species: Hamster  
Dose: 1 UMOL/L  
Cell Type: Embryo  
Mutation test: Unscheduled DNA synthesis

Species: Hamster  
Dose: 500 UMOL/L  
Cell Type: lung  
Mutation test: DNA inhibition

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

Species: Hamster  
Dose: 20 MG/L  
Cell Type: ovary  
Mutation test: Cytogenetic analysis

Species: Hamster  
Dose: 30 UMOL/L  
Cell Type: Embryo  
Mutation test: Cytogenetic analysis

Species: Hamster  
Dose: 1 UMOL/L  
Cell Type: Embryo  
Mutation test: Sister chromatid exchange

Species: Hamster  
Dose: 500 UG/L  
Cell Type: ovary  
Mutation test: Sister chromatid exchange

Species: Hamster  
Dose: 20 UMOL/L

Cell Type: lung  
Mutation test: Sister chromatid exchange

Species: Hamster  
Dose: 1250 UG/L  
Cell Type: Embryo  
Mutation test: SLN

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

Species: Rabbit  
Dose: 6 UMOL/L  
Cell Type: Bone marrow  
Mutation test: 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 vesicle, Cowper's gland, accessory glands. Effects on Fertility: Male fertility index (e.g., # males impregnating females per # males exposed to fertile nonpregnant females).

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## Section 12 - Ecological Information

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### ACUTE ECOTOXICITY TESTS

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

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## Section 13 - Disposal Considerations

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### APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

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.

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## Section 14 - Transport Information

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### DOT

Proper Shipping Name: Hydroquinone  
UN#: 2662  
Class: 6.1  
Packing Group: Packing Group III  
Hazard Label: Keep away from food  
PIH: Not PIH

### IATA

Proper Shipping Name: Hydroquinone  
IATA UN Number: 2662  
Hazard Class: 6.1  
Packing Group: III

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## Section 15 - Regulatory Information

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### EU DIRECTIVES CLASSIFICATION

Symbol of Danger: Xn N  
Indication of Danger: Harmful. Dangerous for the environment.  
R: 22 40 41 43 50 68  
Risk Statements: 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: 26 36/37/39 61  
Safety Statements: 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.

#### US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Toxic (USA) Harmful (EU). Dangerous for the environment.

Risk Statements: Harmful if swallowed. Irritating to skin. Limited evidence of a carcinogenic effect. Risk of serious damage to eyes. May cause sensitization by skin contact. Very toxic to aquatic organisms.

Safety Statements: 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.

US Statements: Possible Carcinogen (US). Possible mutagen. Target organ(s): Blood. Liver.

#### UNITED STATES REGULATORY INFORMATION

SARA LISTED: Yes

DEMINIMIS: 1 %

NOTES: This product is subject to SARA section 313 reporting requirements.

TSCA INVENTORY ITEM: Yes

#### CANADA REGULATORY INFORMATION

WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

DSL: Yes

NDSL: No

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#### Section 16 - Other Information

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#### DISCLAIMER

For R&D use only. Not for drug, household or other uses.

#### 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.