

MATERIAL SAFETY DATA SHEET

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Version 1.5

Section 1 - Product and Company Information

Product Name 1,4-BENZOQUINONE, 98%
Product Number B10358
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
1,4-BENZOQUINONE	106-51-4	Yes

Formula C6H4O2
Synonyms Benzo-chinon (German) * 1,4-Benzoquinone *
p-Benzoquinone (OSHA) * 1,4-Benzoquinone * Chinon
(Dutch, German) * Chinone * p-Chinon (German) *
1,4-Cyclohexadienedione *
2,5-Cyclohexadiene-1,4-dione * 1,4-Cyclohexadiene
dioxide * 1,4-Diossibenzene (Italian) *
1,4-Dioxybenzene * 1,4-Dioxy-benzol (German) *
NCI-C55845 * PBQ 2 * Quinone * Quinone
(ACGIH:OSHA) * p-Quinone * RCRA waste number U197
* Steara PBQ * USAF P-220

RTECS Number: DK2625000

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Flammable (USA) Highly Flammable (EU). Toxic. Dangerous for the environment.

Heating may cause an explosion. Toxic by inhalation and if swallowed. Irritating to respiratory system and skin. Risk of serious damage to eyes. Very toxic to aquatic organisms.

Flammable solid. Target organ(s): Eyes.

HMIS RATING

HEALTH: 2*

FLAMMABILITY: 2

REACTIVITY: 1

NFPA RATING

HEALTH: 2

FLAMMABILITY: 2

REACTIVITY: 1

*additional chronic hazards present.

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

Section 4 - First Aid Measures

ORAL EXPOSURE

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

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.

Section 5 - Fire Fighting Measures

FLAMMABLE HAZARDS

Flammable Hazards: Yes

EXPLOSION HAZARDS

May explode when heated.

EXPLOSION DATA

Dust Potential: This material, like most materials in powder form, is capable of creating a dust explosion.

FLASH POINT

170.6 °F 77 °C Method: closed cup

AUTOIGNITION TEMP

435 °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): Flammable solid. Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL

Evacuate area. Shut off all sources of ignition. Use nonsparking tools.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

Saturated Vapor Conc.	N/A	
Bulk Density	N/A	
Odor Threshold	0.106 ppm	
Volatile%	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Surface Tension	32.58 mN/m	112 °C
Partition Coefficient	Log Kow: 0.2	
Decomposition Temp.	243 °C	
Flash Point	170.6 °F 77 °C	Method: closed cup
Explosion Limits	N/A	
Flammability	N/A	
Autoignition Temp	435 °C	
Refractive Index	N/A	
Optical Rotation	N/A	
Miscellaneous Data	4.8 MM/S BURNING RATIOATA 4.1 PGII FLAMMABLE E SOLID	
Solubility	Other Solvents: SOLUBLE IN ALKALIES HOT PETROLEUM ETHER	

N/A = not available

Section 10 - Stability and Reactivity

STABILITY

Stable: Stable.

Conditions of Instability: May explode when heated. Do not heat above: 50°C

Conditions to Avoid: Sensitive to moisture.

Materials to Avoid: Reacts violently with:, Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE

Skin Contact: Causes skin irritation.

Skin Absorption: May be harmful if absorbed through the skin.

Eye Contact: Causes eye irritation.

Inhalation: Toxic if inhaled. Material is irritating to mucous membranes and upper respiratory tract.

Ingestion: Toxic if swallowed.

TARGET ORGAN(S) OR SYSTEM(S)

Eyes.

SIGNS AND SYMPTOMS OF EXPOSURE

Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. Damage to the eyes.

TOXICITY DATA

Oral

Rat

100 mg/kg
LD50

Oral
Rat
130 mg/kg
LD50

Intraperitoneal
Rat
30 MG/KG
LD50

Intravenous
Rat
25 MG/KG
LD50

Oral
Mouse
25 mg/kg
LD50

Remarks: Behavioral:Somnolence (general depressed activity).
Behavioral:Tremor. Skin and Appendages: Other: Hair.

Intraperitoneal
Mouse
8500 UG/KG
LD50

Remarks: Peripheral Nerve and Sensation:Spastic paralysis with
or without sensory change. Behavioral:Muscle contraction or
spasticity. Lungs, Thorax, or Respiration:Cyanosis.

Subcutaneous
Mouse
93800 UG/KG
LD50

Subcutaneous
Mammal
296 MG/KG
LD50

CHRONIC EXPOSURE - CARCINOGEN

Result: This product is or contains a component that is not
classifiable as to its carcinogenicity based on its IARC, ACGIH,
NTP, or EPA classification.

Species: Mouse
Route of Application: Skin
Dose: 800 MG/KG
Exposure Time: 29W
Frequency: C

Result: Tumorigenic:Equivocal tumorigenic agent by RTECS
criteria. Lungs, Thorax, or Respiration:Tumors. Skin and
Appendages: Other: Tumors.

Species: Mouse
Route of Application: Skin
Dose: 6326 MG/KG
Exposure Time: 43W
Frequency: C

Result: Tumorigenic: Equivocal tumorigenic agent by RTECS criteria. Lungs, Thorax, or Respiration: Tumors. Skin and Appendages: Other: Tumors.

IARC CARCINOGEN LIST

Rating: Group 3

CHRONIC EXPOSURE - MUTAGEN

Species: Human
Dose: 100 UMOL/L
Cell Type: Bone marrow
Mutation test: DNA

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: Mouse
Route: Oral
Dose: 20 MG/KG
Mutation test: Micronucleus test

Species: Mouse
Dose: 50 UMOL/L
Cell Type: Embryo
Mutation test: Micronucleus test

Species: Mouse
Dose: 400 UG/L
Cell Type: Embryo
Mutation test: Morphological transformation.

Species: Mouse
Dose: 4 UMOL/L
Cell Type: lymphocyte
Mutation test: DNA damage

Species: Mouse
Dose: 5 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: 6 UMOL/L
Cell Type: Other cell types
Mutation test: Other mutation test systems

Species: Mouse
Dose: 2100 NMOL/L

Cell Type: lymphocyte
Mutation test: Mutation in mammalian somatic cells.

Species: Hamster
Dose: 6700 UMOL/L
Cell Type: lung
Mutation test: Micronucleus test

Species: Rabbit
Dose: 2 UMOL/L
Cell Type: Bone marrow
Mutation test: Other mutation test systems

Section 12 - Ecological Information

ACUTE ECOTOXICITY TESTS

Test Type: EC50 Algae
Species: Selenastrum capricornutum resp.
Time: 4 h
Value: 0.08 mg/l

Test Type: LC50 Fish
Time: 96 h
Value: 0.4 mg/l

Test Type: LC50 Fish
Species: Onchorhynchus mykiss (Rainbow trout)
Time: 96 h
Value: 0.04 - 0.125 mg/l

Section 13 - Disposal Considerations

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.

Section 14 - Transport Information

DOT

Proper Shipping Name: Benzoquinone
UN#: 2587
Class: 6.1
Packing Group: Packing Group II
Hazard Label: Toxic substances.
PIH: Not PIH

IATA

Proper Shipping Name: Benzoquinone
IATA UN Number: 2587
Hazard Class: 6.1
Packing Group: II

Section 15 - Regulatory Information

EU DIRECTIVES CLASSIFICATION

Symbol of Danger: T N
Indication of Danger: Toxic. Dangerous for the environment.
R: 23/25 36/37/38 50

Risk Statements: Toxic by inhalation and if swallowed.
Irritating to eyes, respiratory system and skin. Very toxic to aquatic organisms.

S: 26 28 45 61

Safety Statements: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of soap-suds. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Avoid release to the environment. Refer to special instructions/safety data sheets.

US CLASSIFICATION AND LABEL TEXT

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

Risk Statements: Heating may cause an explosion. Toxic by inhalation and if swallowed. Irritating to respiratory system and skin. Risk of serious damage to eyes. Very toxic to aquatic organisms.

Safety Statements: Keep away from sources of ignition - no smoking. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of soap-suds. Wear eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Avoid release to the environment. Refer to special instructions/safety data sheets.

US Statements: Flammable solid. Target organ(s): Eyes.

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

Section 16 - Other Information

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.