

# Material Safety Data Sheet

HAZARD WARNINGS	RISK PHRASES	PROTECTIVE CLOTHING
  	<b>Combustible material; avoid heat and sources of ignition.</b> <b>Toxic compound, do not ingest or inhale. Avoid all contact with this material.</b> Irritating to skin, eyes, and the respiratory system. <b>DANGER, MAY CAUSE CANCER.</b>	   

## Section I. Chemical Product and Company Identification

Chemical Name	<b>1,4-Benzoquinone</b>		
Catalog Number	B0887	Supplier	TCI America 9211 N. Harborgate St. Portland OR 1-800-423-8616
Synonym	p-Benzoquinone, Quinone		
Chemical Formula	C <sub>6</sub> H <sub>4</sub> O <sub>2</sub>		
CAS Number	106-51-4	In case of Emergency Call	<b>Chemtrec®</b> <b>(800) 424-9300 (U.S.)</b> <b>(703) 527-3887 (International)</b>

## Section II. Composition and Information on Ingredients

Chemical Name	CAS Number	Percent (%)	TLV/PEL	Toxicology Data
1,4-Benzoquinone	106-51-4	90% (T)	This chemical is classified as a possible carcinogen. There is no acceptable exposure limit for a carcinogen.	Rat LD <sub>50</sub> (intraperitoneal) 30 mg/kg Rat LD <sub>50</sub> (oral) 130 mg/kg Mouse LD <sub>50</sub> (intraperitoneal) 8500 mg/kg Rat LD <sub>50</sub> (intravenous) 25 mg/kg

## Section III. Hazards Identification

Acute Health Effects	Toxic if ingested or inhaled. Avoid prolonged contact with this material. Overexposure may result in serious illness or death. Irritating to eyes and skin on contact. Inhalation causes irritation of the lungs and respiratory system. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.
Chronic Health Effects	<b>CARCINOGENIC EFFECTS</b> : May cause cancer. (sufficient evidence in animals, no adequate data in humans) Tumorigenic: Mouse (dermal) 6326 mg/kg/43W-C. Equivocal tumorigenic agent by RTECS criteria. Tumorigenic: Mouse (dermal) 800 mg/kg/29W-C. Equivocal tumorigenic agent by RTECS criteria. <b>MUTAGENIC EFFECTS</b> : Not available. <b>TERATOGENIC EFFECTS</b> : Not available. <b>DEVELOPMENTAL TOXICITY</b> : Not available. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

## Section IV. First Aid Measures

Eye Contact	Check for and remove any contact lenses. DO NOT use an eye ointment. Flush eyes with running water for a minimum of 15 minutes, occasionally lifting the upper and lower eyelids. Seek medical attention. Treat symptomatically and supportively.
Skin Contact	After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. Seek medical attention. Treat symptomatically and supportively. Wash any contaminated clothing before reusing.
Inhalation	Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform artificial respiration. WARNING: It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention and, if possible, show the chemical label. Treat symptomatically and supportively.
Ingestion	INDUCE VOMITING by sticking finger in throat. Lower the head so that the vomit will not reenter the mouth and throat. Loosen tight clothing such as a collar, tie, belt, or waistband. If the victim is not breathing, administer artificial respiration. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Seek immediate medical attention and, if possible, show the chemical label. Treat symptomatically and supportively.

**Section V. Fire and Explosion Data**

Flammability	Combustible.	Auto-Ignition	Not available.
Flash Points	78°C (172.4°F).	Flammable Limits	Not available.
Combustion Products	These products are toxic carbon oxides (CO, CO <sub>2</sub> ).		
Fire Hazards	No specific information is available regarding the flammability of this compound in the presence of various materials.		
Explosion Hazards	Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. No additional information is available regarding the risks of explosion.		
Fire Fighting Media and Instructions	SMALL FIRE: Use DRY chemicals, CO <sub>2</sub> , water spray or foam. LARGE FIRE: Use water spray, fog or foam. DO NOT use water jet.		

**Section VI. Accidental Release Measures**

Spill Cleanup Instructions	Combustible material. Toxic solid. Harmful solid. Irritating solid. Stop leak if without risk. DO NOT get water inside container. DO NOT touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all sources of ignition. Consult federal, state, and/or local authorities for assistance on disposal.
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**Section VII. Handling and Storage**

Handling and Storage Information	COMBUSTIBLE. TOXIC. IRRITANT. MAY CAUSE CANCER. Handle with caution and minimize exposure. Keep away from heat and sources of ignition. Mechanical exhaust required. When not in use, tightly seal the container and store in a dry, cool place. Avoid excessive heat and light. DO NOT ingest. DO NOT breathe dust. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Treat symptomatically and supportively. Avoid contact with skin and eyes. Always store away from incompatible compounds such as oxidizing agents.
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**Section VIII. Exposure Controls/Personal Protection**

Engineering Controls	Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.
Personal Protection	Splash goggles. Lab coat. Dust respirator. Boots. Gloves. A MSHA/NIOSH approved respirator must be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product. 
Exposure Limits	This chemical is classified as a possible carcinogen. There is no acceptable exposure limit for a carcinogen.

**Section IX. Physical and Chemical Properties**

Physical state @ 20°C	Yellow to greenish gold powder.	Solubility	Soluble in alkalis, hot petroleum ether. >10% in ether. >10% in ethanol. Water solubility= 1.113X10 <sup>-4</sup> mg/L @ 18°C.
Specific Gravity	1.318	Partition Coefficient	Not available.
Molecular Weight	108.1	Vapor Pressure	0.1 mm of Hg (@ 20°C)
Boiling Point	Not available.	Vapor Density	3.73 (Air = 1)
Melting Point	113 to 115°C	Volatility	Not available.
Refractive Index	Not available.	Odor	Acrid, chlorine-like odor.
Critical Temperature	Not available.	Taste	Not available.
Viscosity	Not available.		

**Section X. Stability and Reactivity Data**

Stability	This material is stable if stored under proper conditions. (See Section VII for instructions)
Conditions of Instability	Avoid excessive heat and light.
Incompatibilities	Reactive with oxidizing agents.

**Section XI. Toxicological Information**

RTECS Number	DK2625000
Routes of Exposure	Eye contact. Inhalation. Ingestion. Skin contact.
Toxicity Data	Rat LD <sub>50</sub> (intraperitoneal) 30 mg/kg Rat LD <sub>50</sub> (oral) 130 mg/kg Mouse LD <sub>50</sub> (intraperitoneal) 8500 mg/kg Rat LD <sub>50</sub> (intravenous) 25 mg/kg
Chronic Toxic Effects	<b>CARCINOGENIC EFFECTS</b> : May cause cancer. (sufficient evidence in animals, no adequate data in humans) Tumorigenic: Mouse (dermal) 6326 mg/kg/43W-C. Equivocal tumorigenic agent by RTECS criteria. Tumorigenic: Mouse (dermal) 800 mg/kg/29W-C. Equivocal tumorigenic agent by RTECS criteria. <b>MUTAGENIC EFFECTS</b> : Not available. <b>TERATOGENIC EFFECTS</b> : Not available. <b>DEVELOPMENTAL TOXICITY</b> Not available. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.
Acute Toxic Effects	Toxic if ingested or inhaled. Avoid prolonged contact with this material. Overexposure may result in serious illness or death. Irritating to eyes and skin on contact. Inhalation causes irritation of the lungs and respiratory system. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.

**Section XII. Ecological Information**

Ecotoxicity	Not available.
Environmental Fate	1,4-Benzoquinone may be released to the environment in effluents during its commercial production; and use; and in waste waters from the coal industry. If released to soil it is likely to leach (estimated Koc of 30) and may volatilize and photodegrade on soil surfaces. A single degradation study found 1,4-benzoquinone to be rapidly degraded in a chernozem soil to stable metabolites. If released to the aquatic environment, it may be degraded by photolysis as it absorbs UV radiation. In water, 1,4-benzoquinone is not expected to volatilize, adsorb to particulate matter or sediment, or bioaccumulate in aquatic organisms. Biodegradation in water may be important based upon the rapid degradation of 1,4-benzoquinone in soil. If released to the atmosphere, it will react rapidly in the vapor phase with both hydroxyl radicals and ozone with half-lives of 3.6 and 3.3 days, respectively, and may be susceptible to direct photolysis. The ambient atmospheric concentration of 1,4-benzoquinone has been reported to be less than 15 to 80 ng/cu m and benzoquinone has been detected in tobacco smoke. Inhalation appears to be the most significant route of human exposure. (SRC)

**Section XIII. Disposal Considerations**

Waste Disposal	Recycle to process, if possible. Consult your local or regional authorities. You may be able to dissolve or mix material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber system. Observe all federal, state, and local regulations when disposing of this substance.
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**Section XIV. Transport Information**

DOT Classification	DOT CLASS 6.1: Toxic material.
PIN Number	UN2587
Proper Shipping Name	Benzoquinone
Packing Group (PG)	II
DOT Pictograms	

**Section XV. Other Regulatory Information and Pictograms**

TSCA Chemical Inventory (EPA)	This compound is <b>ON</b> the EPA Toxic Substances Control Act (TSCA) inventory list.
WHMIS Classification (Canada)	WHMIS CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). WHMIS CLASS D-2A: Material causing other toxic effects (VERY TOXIC).
EINECS Number (EEC)	203-405-2
EEC Risk Statements	R28- Very toxic if swallowed. R36/37/38- Irritating to eyes, respiratory system and skin.
Japanese Regulatory Data	Not available.

**Section XVI. Other Information****Version 1.0****Validated on 12/18/1997.****Printed 1/22/2005.****Notice to Reader**

TCI laboratory chemicals are for research purposes only and are NOT intended for use as drugs, food additives, household, or pesticides. The information herein is believed to be correct, but does not claim to be all inclusive and should be used only as a guide. Neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All chemical reagents must be handled with the recognition that their chemical, physiological, toxicological, and hazardous properties have not been fully investigated or determined. All chemical reagents should be handled only by individuals who are familiar with their potential hazards and who have been fully trained in proper safety, laboratory, and chemical handling procedures. Although certain hazards are described herein, we can not guarantee that these are the only hazards which exist. Our MSDS sheets are based only on data available at the time of shipping and are subject to change without notice as new information is obtained. Avoid long storage periods since the product is subject to degradation with age and may become more dangerous or hazardous. It is the responsibility of the user to request updated MSDS sheets for products that are stored for extended periods. Disposal of unused product must be undertaken by qualified personnel who are knowledgeable in all applicable regulations and follow all pertinent safety precautions including the use of appropriate protective equipment (e.g. protective goggles, protective clothing, breathing equipment, facial mask, fume hood). For proper handling and disposal, always comply with federal, state, and local regulations.

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