

School Material Safety Data Sheet

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MERCURY (II) OXIDE

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SECTION 1. INTRODUCTORY INFORMATION

MATERIAL NAME AND FORMULA: MERCURY (II) OXIDE; HgO

SYNONYMS: Mercuric Oxide; Mercuric Oxide, Red; Mercuric Oxide, Yellow

CAS NUMBER: 21908-53-2

INGREDIENTS: Mercuric oxide, >99%

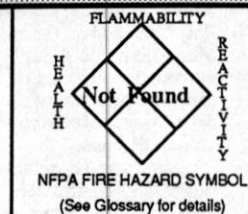
DOT CLASSIFICATION: Poison B

EPA CLASSIFICATION: Hazardous Waste

MANUFACTURERS: Always request Material Safety Data Sheets from your chemical supplier. These should indicate the manufacturer of the substance and include an emergency phone number to call. The Manufacturers section of this book contains a listing of some of the larger manufacturers and available emergency numbers.

DESCRIPTION: Mercuric oxide exists as either a red or yellow heavy, odorless powder. The color depends on particle size; the finer powders (<5 µm) are yellow.

PRELIMINARY INFORMATION: Mercuric oxide is nonflammable but is an oxidizer which can promote or accelerate combustion. The material is highly toxic and releases toxic mercury vapor when heated to decomposition. Most common area of use would be in the chemistry lab. This material is **NOT RECOMMENDED** for use in schools unless educational objectives cannot be met in other ways. If the substance is deemed necessary, use with great caution and take all appropriate safety measures.



SECTION 2. USE AND STORAGE INFORMATION

-- PRELIMINARY PLANNING CONSIDERATIONS --

- Safety glasses or goggles and protective clothing (rubberized apron, etc.) should be worn for all experiments.
- Be sure eyewash station and safety shower are in good working order and readily available.
- Always provide for safe disposal of all chemical waste generated in the lab. Check applicable regulations prior to use.
- The following information is provided even though this material is **NOT RECOMMENDED** for use in schools.
- Provide adequate ventilation or restrict use to fume hood.
- Whenever possible, substitute less hazardous materials.
- Rubber gloves are recommended when working with this material.
- If material is to be used in lab, be sure all students are trained in handling procedures for this highly toxic substance.

-- USAGE PRECAUTIONS AND PROCEDURES --

- READ THE LABEL and follow all precautions.
- Maintain good housekeeping practices to avoid unintentional mixing with incompatible materials. Clean up spills promptly and thoroughly.
- For safety, contact lenses should not be worn in the laboratory; soft lenses may absorb irritants and all lenses may concentrate them. Particles can also adhere to contact lenses and cause corneal damage.
- After working with this material, always wash hands and face before eating, drinking, or smoking.
- Avoid creating airborne dust conditions. Do not inhale dust. Avoid skin contact; prevent eye contact. Keep off clothing and belongings.
- This is an oxidizing agent -- avoid contact with reducing agents and easily oxidizable materials.
- Can decompose to Hg and O₂ on exposure to light or heat. (Hg vapor is highly toxic.)
- Oxygen generation using mercuric oxide includes toxic mercury vapor. If performed, this experiment or demonstration must be done in a fume hood. A tray should be kept under the apparatus to catch spills in the event of breakage.

-- ADDITIONAL INFORMATION --

- Mercury (II) Oxide does not polymerize. The material is stable at room temperature under normal conditions.
- Incompatible with chlorine, hydrogen peroxide, phosphinic acid, hydrazine hydrate, magnesium, phosphorus, sulfur, potassium, and sodium. Reaction with certain of these materials may result in a fire and/or explosion.
- HgO is practically insoluble in water but soluble in most acids. Yellow form is typically more soluble and reactive than red HgO.
- Red form may turn black on heating, and return to red on cooling.

-- PREFERRED STORAGE LOCATION AND METHODS --

- Storage area should be cool and well ventilated. Containers should be tightly closed.
- Do not store chemicals alphabetically by name; store by chemical family instead, to keep compatibles together.
- All chemical containers should be protected from physical damage and kept out of direct sunlight.
- Smoking should not be permitted in areas where chemicals are stored.
- Purchase only amounts equivalent to one year's needs, if at all.
- Should be stored in approved, locked POISONS cabinet.
- Not recommended for use or storage in schools without an absolute need being determined.

SECTION 3. SPILLS AND DISPOSAL PROCEDURES

IF MATERIAL IS SPILLED:

- Ventilate area of spill.
- Cleanup personnel should wear personal protective equipment as necessary to prevent skin or eye contact and inhalation of dust.
- Sweep, vacuum, or scoop up spilled solid, avoiding generation of dust. Place in a suitable container (with secure lid) for later disposal.
- Cleanup methods such as vacuuming (with appropriate filter) or wet mopping will minimize dust dispersion.
- Do not allow release of mercuric oxide into drains or waterways.

DISPOSAL OF SMALL QUANTITIES:

- Contact your supplier or a licensed disposal contractor for specific treatment/disposal procedures.
- Reclaim where possible. Unsalvageable material requires disposal as a hazardous waste.
- DO NOT allow release of solution containing mercury without prior treatment (such as precipitation as the sulfide) to remove mercury to allowable levels.

DISPOSAL OF LARGER AMOUNTS: Contact a licensed disposal company.

FOLLOW ALL APPLICABLE LOCAL, STATE, AND FEDERAL REGULATIONS FOR ALL WASTE DISPOSAL.

SECTION 4: HEALTH HAZARDS

Mercuric Oxide has not been identified as a known or suspected carcinogen by the NTP, IARC, or OSHA.

Current ACGIH TLV: 8-hr. TWA: 0.1 mg/m³ (Skin)* as Hg

Current OSHA PEL for "mercury" is 0.1 mg/m³ as a ceiling concentration.

* Skin notation indicates that absorption through skin may contribute significantly to the overall exposure.

- In its 1973 Criteria Document on Inorganic Mercury, NIOSH recommended a PEL of 0.05 mg Hg/m³ as an 8-hr. TWA for all inorganic mercury compounds.
- Rat, Oral, LD₅₀: 18 mg/kg; Mouse, Oral, LD₅₀: 22 mg/kg.
- Mercuric oxide is highly toxic. Overexposure due to acute inhalation of mercury compounds can cause irritation of the mucous membranes of the respiratory tract, abdominal pain, vomiting, diarrhea, and inflammation of the gums (gingivitis) and mouth (stomatitis). Symptoms of chronic toxicity include psychic and emotional disturbances (excitability, anxiety, depression, indecision, insomnia), nervous system effects (muscular tremors, incoordination), gingivitis, stomatitis, and kidney damage.
- Ingestion can cause severe irritation of the GI tract, difficulty in swallowing, nausea, vomiting, abdominal pain, diarrhea, shock, and death.
- Skin and eye contact may cause irritation.

NOTE: The term "mad as a hatter" is widely thought to be based upon hat makers being poisoned by the mercury compounds they worked with in making felt hats. "Mad as a hatter" has other derivations. See *Mercury, A History of Quicksilver* by Leonard J. Goldwater, York Press, Baltimore, MD, pp 273-275.

SECTION 5: FIRST AID PROCEDURES

Eye contact:

- Flush eyes promptly with plenty of running water for at least 15 minutes, including under the eyelids.
- Get prompt medical attention.*

Skin contact:

- Remove contaminated clothing promptly.
- Wash exposed areas of skin with soap and water.
- Get medical attention if irritation or other symptoms develop.*

Inhalation:

- Remove victim to fresh air; restore and/or support breathing as necessary.
- Get prompt medical attention.*

Ingestion:

- Get prompt medical attention immediately.*
- Give several glasses of water to drink. Induce vomiting – but ONLY if victim is conscious and alert. Repeat. Keep victim warm and at rest.
- Never give anything by mouth to a person who is unconscious or convulsing.

* Get medical help (in school, paramedic, or community), for further treatment, observation, and support after first aid.

SECTION 6: FIRE PROCEDURES AND DATA

- As an oxidizer, mercuric oxide can promote and accelerate combustion, particularly when heated.
- Flood fires with water (if water is a suitable extinguisher for other materials in the fire).
- Mercury vapors (toxic) are produced at high temperatures.
- Prevent runoff to sewers or waterways.
- Extinguishing media: Use media appropriate to surrounding fire conditions.
- For major fires, or if large quantities of this material are involved, fire fighters should wear appropriate protective clothing and use respiratory protection. Self-contained breathing apparatus is recommended.
- A water spray may be used to cool fire-exposed containers and disperse vapors.

THERMAL DECOMPOSITION PRODUCTS: Mercury (vapor) and oxygen.

FLASH POINT AND METHOD(S) ... Not Combustible

AUTOIGNITION TEMPERATURE ... Not Combustible

FLAMMABILITY LIMITS IN AIR (vol. %) : Not Combustible

SECTION 7: PHYSICAL DATA

VAPOR PRESSURE (@ 20°C, mm Hg) ... Negligible

SOLUBILITY IN WATER (@ 25°C) ... 0.053 g/l (0.395 g/l @ 100°C)

SPECIFIC GRAVITY ... 11.1

MELTING POINT ... 932°F (500°C) (Decomposes)

FORULA WEIGHT ... 216.59

DATA SOURCES: Genium's Industrial MSDS #170 (1/86) and references 2, 4-7, 12, 14, 19, 25, 43, 44, 49, 55, 56, 58, 60-62, 82, 501, 506, 509-11.
(see glossary for titles)

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Approvals:

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Indust. Hygiene/Safety

Medical Review

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