

School Material Safety Data Sheet

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SODIUM METAL

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SECTION 1. INTRODUCTORY INFORMATION

MATERIAL NAME AND FORMULA: SODIUM METAL; Na

SYNONYMS: Natrium

CAS NUMBER: 7440-23-5

INGREDIENTS: Sodium (elemental), ca 100%

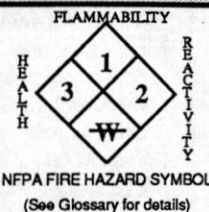
DOT CLASSIFICATION: Flammable Solid; Dangerous when wet. UN1428

EPA CLASSIFICATION: Hazardous Substance

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: Sodium is an odorless, silvery-colored, soft (malleable), waxy metal (at room temperature) that turns grayish-white on exposure to air.

PRELIMINARY INFORMATION: Sodium is a highly reactive and corrosive material. It must be kept away from air and water. Many reactions may cause fire or explosion. Sodium is a strong caustic irritant in contact with living tissue. This material has a variety of lab applications. This material should not be used in schools if alternatives can be found to meet the necessary educational objectives. If its use is deemed necessary, keep amounts used to a minimum and use with great caution.



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.
- Sodium is not recommended for use or storage in schools without an absolute need being determined. Whenever possible, substitute less hazardous materials. Consider substitution of the sodium-lead alloy called "dri-NA," which is 8.8% sodium. Do not substitute potassium for sodium; potassium may form potentially explosive peroxides in storage.
- Eliminate all possible sources of ignition.
- Review sections 3, 5, and 6 to prepare for possible accidents or emergencies. Have proper fire-extinguishing agent on hand.
- Heavy chemical-resistant gloves are recommended when working with this material. Additional protective equipment including face shield should also be worn.

-- USAGE PRECAUTIONS AND PROCEDURES --

- **READ THE LABEL** and follow all precautions.
- Maintain good housekeeping practices to avoid unintentional mixing with incompatible materials. Be sure all work surfaces and tools are perfectly dry.
- 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. Remove contaminated clothing and launder before reuse.
- Keep away from strong oxidizing agents and sources of heat or ignition.
- Sodium may ignite spontaneously when heated in air, or if a large enough piece is placed in water to react. Burning material may spatter or explode in such circumstances.
- Flammable and explosive hydrogen gas is produced upon reaction with water or acids. Dangerous fumes may also be liberated. Reaction also produces caustic sodium hydroxide solution.
- In the absence of water, oxygen, or halides, sodium can be handled safely. Remove only amount of material immediately needed from storage area. Use a metal container with a tightly fitting lid for transfer to work area.

-- ADDITIONAL INFORMATION --

- Sodium does not polymerize. Sodium is not a stable material; it may react or ignite spontaneously in air or in contact with water. It may react vigorously or explosively with oxidizing agents. The following materials may cause an explosive reaction: acids; air; halides such as aluminum bromide, magnesium chloride, and mercuric iodide; carbon dioxide; ammonia; chlorinated hydrocarbons; hydrogen peroxide; lead oxide; phosphorus; potassium oxides; sulfur; sulfur dioxide; and especially water.

-- PREFERRED STORAGE LOCATION AND METHODS --

- Storage area should be cool and well ventilated. Containers should be tightly closed. All chemical containers should be protected from physical damage and kept out of direct sunlight. Purchase only amounts equivalent to one year's needs, if at all.
- Smoking should not be permitted in areas where chemicals are stored.
- Should be stored in approved **FLAMMABLES** cabinet, away from water, oxidizing agents, and sources of heat or ignition. Sodium must be stored in airtight containers under an inert atmosphere such as nitrogen, or under naphtha, kerosene, or other liquid hydrocarbon containing no water or free oxygen. Never store under halogenated hydrocarbons such as Freon®, methylene chloride, or 1,1,1-trichloroethane.
- No automatic sprinklers should be present in storage area. Have appropriate fire-extinguishing agent available in storage area (see sect. 6).

SECTION 3. SPILLS AND DISPOSAL PROCEDURES

IF MATERIAL IS SPILLED:

- Ventilate area of spill.
- Eliminate all possible sources of ignition. Be prepared for possible spontaneous ignition of sodium.
- Cleanup personnel should wear personal protective equipment as necessary, including heavy chemical-resistant gloves, to prevent skin or eye contact. Self-contained breathing apparatus may be necessary.
- Do not get water on spilled material or inside material container.
- Use nonsparking tools for cleanup.
- Carefully scoop up spilled material and collect in a suitable metal container (with secure lid) for disposal or reclamation. Cover sodium with naphtha, kerosene, etc., to exclude air and water (see sect. 2).

DISPOSAL OF SMALL QUANTITIES:

- Contact your supplier or a licensed disposal contractor for specific treatment/disposal procedures.
- Do not allow sodium to enter drain or sewer: it is an explosion hazard.

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

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

- No exposure limits have been established for elemental sodium metal, nor is any toxicity data available.
- When sodium is mixed with water, sodium hydroxide is formed (CAS #1310-73-2). NaOH has an OSHA PEL and ACGIH TLV; 8-hr. TWA of 2 mg/m³ (see School MSDS #163).
- Sodium is harmful or fatal if swallowed, inhaled, or absorbed through the skin and mucous membranes.
- It is corrosive upon skin contact or contact with other body tissue.
- Inhalation may cause upper respiratory tract irritation, inflammation, and pulmonary damage.
- Sodium may react violently and explosively on contact with moist tissue; heat is generated resulting in thermal and chemical burns.
- Alkalies penetrate the skin slowly; therefore, extent of damage depends on amount and duration of exposure.
- Sodium may cause burns, ulcerations, and death of tissue (necrosis). Fumes are highly irritating.
- Eye contact will cause burns, conjunctivitis, and may cause corneal damage, corneal opacification, and possible blindness.
- If ingested, sodium will cause severe pain, vomiting, diarrhea, and possible penetrating ulcers.
- Chronic effects: May cause chronic dermatitis, mucous membrane irritation, and lung damage.

SECTION 5: FIRST AID PROCEDURES**Eye contact:**

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

Skin contact:

- Remove sodium-contaminated clothing promptly.
- Wash exposed areas of skin with soap and water until all chemical is removed. Treat chemical burns as indicated. Get prompt medical attention.*

Inhalation:

- Remove victim to fresh air. If victim is not breathing, give artificial respiration, preferably mouth to mouth. If breathing is difficult, have trained person administer oxygen. Get prompt medical attention.*

Ingestion:

- If swallowed, and victim is conscious, use gastric lavage followed by installation of olive oil or demulcents.
- Get prompt medical attention.*
- 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

- Remove sodium containers from fire area if possible to do so safely. Sodium is extremely dangerous in contact with moisture or water, releasing hydrogen with sufficient heat to cause ignition or explosion. It ignites spontaneously in air or with oxygen. Toxic fumes may be released in a fire situation (see below).
- Sodium burns violently, accompanied by explosions that can cause spattering of the material.
- Extinguishing media: Use graphite, soda ash, powdered sodium chloride, or suitable dry powder. Pails are adequate for storing extinguishing agent if material is kept dry. Trade names of extinguishing agents include Met-L-X® and G-1® graphite powders.
- 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.
- Sodium fires may reignite after fire is extinguished. Keep sodium away from drains or sewers: may create additional fire or explosion hazard.
- **DO NOT USE** water, foam, carbon dioxide, or halogenated extinguishing agents (Halon®).

THERMAL OXIDATIVE DEGRADATION PRODUCTS INCLUDE: Toxic fumes of sodium, which can produce flammable hydrogen gas and sodium hydroxide on contact with water.

FLASH POINT AND METHOD(S) ... Flammable Solid

AUTOIGNITION TEMPERATURE ... 250°F (121°C)

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

SECTION 7: PHYSICAL DATA

BOILING POINT (@ 1 atm) ... 1621°F (883°C)

VAPOR PRESSURE (@ 400°C, mm Hg) ... 1.23

SOLUBILITY IN WATER (@ 20°C) ... Reacts with Water.

pH OF AQUEOUS SOLUTION ... Alkaline (>7)

SPECIFIC GRAVITY (@ 25°C) ... 0.967

MELTING POINT ... 208°F (98°C)

ATOMIC WEIGHT ... 22.9

DATA SOURCES: Genium's Industrial MSDS #219 (9/87) and references 1-11, 18, 24, 37, 39, 44, 82, 84, 501, 506, 509-11.
(see glossary for titles)

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Approvals:

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Medical Review