Material Safety Data Sheet

Sodium Persulfate

MSDS Ref. No.: 7775-27-1

Updated Date: 25th January 2017

1. Product and Company Identification

Product Name: Sodium Persulfate

Synonyms: Sodium Peroxydisulfate; Peroxydisulfuric Acid;Disodium Peroxydisulfate

Chemical Formula: $Na_2S_2O_8$

Molecular Weight: 238.03

CAS No.: 7775-27-1

General Use: Polymerization initiator. Etchant and cleaner in manufacture of printed circuit boards. Booster in hair bleaching formulations in cosmetics. Secondary oil recovery systems as a polymerization initiator and a gel breaker.

MANUFACTURER

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2. Composition and Information on Ingredients

Name	CAS #	Wt. %	EC No.	EC Class
Sodium Persulfate	7775-27-1	>99%	231-892-1	Xn-O;R8-R22-R36/37/38-R42/43

3. Hazards Identification

Emergency Overview:

• White, odorless, crystals
• Oxidizer.
• Decomposes in storage under conditions of moisture (water/water vapor) and/or excessive heat causing release of oxides of sulfur and oxygen that supports combustion. Decomposition could form a high temperature melt. See Section 10 ("Stability and Reactivity").

Potential Acute Health Effects:

Very hazardous in case of skin contact (irritant, sensitizer),eye contact (irritant), and inhalation. Hazardous in case of ingestion. Slightly hazardous in case of skin contact (permeator). Prolong edexposure may result in skin burns and ulcerations. Over-exposure by inhalation may cause respiratory irritation. Inflammation of the eye is characterized by redness, watering,and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering. Exposure to high levels of

persulfate dust may cause difficulty in breathing in sensitive persons.

Chronic Health Effects:
Very hazardous in case of skin contact (corrosive, irritant, sensitizer), eye contact (irritant), and inhalation. Hazardous in case of ingestion. Slightly hazardous in case of skin contact (permeator). CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to blood, lungs. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation.

4. First Aid Measures

Eye Contact:
Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.

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. Cold water may be used. Cover the irritated skin with an emollient. If irritation persists, seek medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

Serious 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 mouth-to-mouth resuscitation. Seek medical attention.

Ingestion: Do not induce vomiting. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

5. Fire Fighting Measures (Fire and Explosion Data)

Fire: Not expected to be a fire hazard.

Explosion: Strong oxidizer. Contact with combustible materials, flammable materials, or powdered metals can cause fire or explosion. NOTE: Decomposes at melting point.

Fire Extinguishing Media: Water spray.

Fire Fighting Procedure: Do not use carbon dioxide or other gas filled fire extinguishers; they will have no effect on decomposing persulfates. Wear full

protective clothing and self-contained breathing apparatus.

Flammable Limits: Non-combustible

Sensitivity to Impact: No data available

Sensitivity to Static Discharge: Not available

Special Information: Firefighters should wear proper protective equipment and self-contained breathing apparatus with full face piece operated in positive pressure mode. Move exposed containers from fire area if it can be done without risk. Use water to keep fire-exposed containers cool.

6. Accidental Release Measures

Wear self-contained breathing apparatus and full protective clothing. Keep combustibles (wood, paper, oil, etc.) away from spilled material. With clean shovel, carefully place material into clean, dry container and cover; remove from area. Flush spill area with water.

RELEASE NOTES: Spilled material should be collected and put in approved DOT container and isolated for disposal. Isolated material should be monitored for signs of decomposition (fuming/smoking). If spilled material is wet, dissolve with large quantity of water and dispose as a hazardous waste. All disposals should be carried out according to regulatory agencies procedures.

7. Handling and Storage

Handling: Use adequate ventilation when transferring product from bags or drums. Wear respiratory protection if ventilation is inadequate or not available. Use eye and skin protection. Use clean plastic or stainless steel scoops only.

Storage: Keep container tightly closed. Store in a cool, clean, dry place away from point sources of heat, e.g. radiant heaters or steam pipes. Use first in, first out storage system. Avoid contamination of opened product. In case of fire or decomposition (fuming/smoking), deluge with plenty of water to control decomposition. For storage, refer to NFPA Bulletin 430 on storage of liquid and solid oxidizing materials.

COMMENTS: VENTILATION: Provide mechanical general and/or local exhaust ventilation to prevent release of dust into work environment. Spills should be collected into suitable containers to prevent dispersion into the air.

8. Exposure Controls/Personal Protection

Chemical Name	ACGIH	OSHA	Supplier
Sodium Persulfate	0.1 mg/m3 (TWA)		

Engineering Controls: Provide mechanical local general room ventilation to prevent release of dust into the work environment. Remove contaminated clothing immediately

and wash before reuse.

Personal Protective Equipment

Eyes and Face: Use cup type chemical goggles. Full face shield may be used. Maintain eye wash fountain and quick-drench facilities in work area.

- **Respiratory:** Use approved dust respirator when airborne dust is expected.
- **Protective Clothing:** Normal work clothes. Rubber or neoprene footwear.
- **Gloves:** Rubber or neoprene gloves. Thoroughly wash the outside of gloves with soap and water prior to removal. Inspect regularly for leaks.

9. Physical and Chemical Properties

Physical state and appearance: Solid. (Solid crystalline powder.)
Odor: Odorless.
Taste: Bitter. (Strong.)
Molecular Weight: 238.1 g/mole
Color: White.
pH: typically 5.0 - 7.0 @ 25 °C (1% solution)
Boiling Point: Not available.
Melting Point: Decomposes.
Critical Temperature: Not available.
Specific Gravity: 2.6 (H_2O = 1)
Vapor Pressure: Not applicable.
Vapor Density: Not available. (Air = 1)
Volatility: Not available.
Odor Threshold: Not available.
Water/Oil Dist. Coeff.: Not available.
Ionicity (in Water): Not available.
Dispersion Properties: See solubility in water.
Solubility: Soluble in cold water, hot water (73 % @ 25 °C (by wt.)). Insoluble in methanol, diethylether,
Oxidizing Propertites: Oxidizer
Autoignition Temperature: Not applicable. No evidence of combustion up to 800°C. Decomposition will occur upon heating.
Coefficient of Oil/ Water: Not applicable
Density/ Weight Per Volume: Not available
Evaporation Rate: Not applicable (Butyl Acetate = 1)
Flash Point: Non-combustible

10. Stability and Reactivity

Stability: Stable (becomes unstable in presence of heat, moisture and/or contamination).

Instability Temperature: Not available.

Polymerization: Will not occur

Incompatible Materials: Acids, alkalis, halides (fluorides, chlorides, bromides and iodides), ombustible materials, most metals and heavy metals, oxidizable materials, other oxidizers, reducing agents, cleaners, and organic or carbon containing compounds. Contact with incompatible materials can result in highly reactive such as a material decomposition or other uncontrolled reactions.

Hazardous Decomposition Products: Oxygen that supports combustion and oxides of sulfur.

Corrosivity: Corrosive in presence of steel, of aluminum, of zinc, of copper. Non-corrosive in presence of glass.

Special Remarks on Reactivity: Incompatible with alcohols.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Conditions to Avoid: Heat, moisture and contamination.

COMMENTS: PRECAUTIONARY STATEMENT: Use of persulfates in chemical reactions requires appropriate precautions and design considerations for pressure and thermal relief Decomposing persulfates will evolve large volumes of gas and/or vapor, can accelerate exponentially with heat generation, and create significant and hazardous pressures if contained and not properly controlled or mitigated. Use with alcohols in the presence of water has been demonstrated to generate conditions that require rigorous adherence to process safety methods and standards to prevent escalation to an uncontrolled reaction.

11. Toxicological Information

Routes of Entry: Eye contact, inhalation, ingestion.

Chronic Effects on Humans: The substance is toxic to blood, lungs.

Other Toxic Effects on Humans: Very hazardous in case of skin contact (irritant, sensitizer), of inhalation. Hazardous in case of ingestion. Slightly hazardous in case of skin contact (permeator).

Dermal LD50: > 10 g/kg [FMC Ref. ICG/T-79.029]

Oral LD50: 895 mg/kg (rat) [FMC Ref. ICG/T-79.029]

Inhalation LC50: 5.1 mg/l (rat) [FMC Ref. I95-2017]

Sensitization: May be sensitizing to allergic persons. [FMC Ref. ICG/T-79.029]

Target Organs: Eyes, skin, respiratory passages

Chronic Effects From Overexposure: Sensitive persons may develop dermatitis and asthma [Respiration 38:144, 1979]. Groups of male and female rats were fed 0, 300 or 3000 ppm sodium persulfate in the diet for 13 weeks, followed by 5000 ppm for 5 weeks. Microscopic examination of tissues revealed some injury to the gastrointestinal tract at the high dose (3000 ppm) only. This effect is not unexpected for an oxidizer at high concentrations. [Ref. FMC I90-1151, oxicologist 1:149, 1981].

Special Remarks on Chronic Effects on Humans: May cause allergic skin reactions with repeated exposure.

Special Remarks on other Toxic Effects on Humans: CAUTION: Certain sensitive individuals may develop eczema and/or asthma on exposure to this material.

CARCINOGENICITY:

NTP:	IARC	OSHA	OTHER
Not listed	Not listed	Not listed	ACGIH: Not listed

12. Ecological Information

Products of Biodegradation: Possibly hazardous short/long term degradation products are to be expected.
Toxicity of the Products of Biodegradation: The products of degradation are more toxic.
Bluegill sunfish, 96-hour LC50 = 771 mg/L [FMC Study I92-1250]
Rainbow trout, 96-hour LC50 = 163 mg/L [FMC Study I92-1251]
Daphnia, 48-hour LC50 = 133 mg/L [FMC Study I92-1252]
Grass shrimp, 96-hour LC50 = 519 mg/L [FMC Study I92-1253]

CHEMICAL FATE INFORMATION: Biodegradability does not apply to inorganic substances.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

Special Note: Dispose as a hazardous waste in accordance with local, state and federal regulatory agencies.

14. Transport Information

U.S. Department of Transporation (D.O.T.)
Proper Shipping Name: Sodium Persulfate
Primary Hazard Class/Division: 5.1 (Oxidizer)
UN/NA Number: UN 1505
Packing Group: III
Label(s): 5.1 (Oxidizer)
Placard(s): 5.1 (Oxidizer)
Marking(s): Sodium Persulfate, UN 1505
Additional Informaiton: Hazardous Substance/RQ: Not applicable

International Maritime Dangerous Goods (IMDG)
Proper Shipping Name: Sodium Persulfate

International Civil Aviation Organization (ICAO)/ International Air Transport Association (IATA)
Proper Shipping Name: Sodium Persulfate

Other Information:
Protect from physical damage. Do not store near acids, moisture or heat.

15. Regulatory Information

United State
SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)
SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355, PPENDIX A): Not applicable
SECTION 311 HAZARD CATEGORIES (40 CFR 370): Fire Hazard, Immediate (Acute) Health Hazard
SECTION 312 THRESHOLD PLANNING QUANTITY (40 CFR 370): The Threshold Planning Quantity (TPQ) for this product, if treated as a mixture, is 10,000 lbs; however, this product contains the following ingredients with a TPQ of less than 10,000 lbs.: None
SECTION 313 REPORTABLE INGREDIENTS (40 CFR 372): There are no ingredients in this product, which are subject to Section 313 reporting requirements.
CERCLA (COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT) CERCLA DESIGNATION & REPORTABLE QUANTITIES (RQ) (40 CFR 302.4): Unlisted, RQ = 100 lbs., Ignitability
TSCA (TOXIC SUBSTANCE CONTROL ACT)
TSCA INVENTORY STATUS (40 CFR 710): All components are listed or exempt.
RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)
RCRA IDENTIFICATION OF HAZARDOUS WASTE (40 CFR 261): Waste Number: D001

CANADA
WHMIS (WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM):
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

Hazard Classification / Division: C
D2A
D2B
Domestic Substance List: All components are listed or exempt.

INTERNATIONAL LISTINGS

Australia (AICS): Listed
China: Listed
Japan (ENCS): (1)-1131
Korea: KE-12369
Philippines (PICCS): Listed
New Zealand: Listed

HAZARD AND RISK PHRASE DESCRIPTIONS:

EC Symbols: Xn (Harmful)
O (Oxidizer)
EC Risk Phrases: R8 (Contact with combustible material may cause fire)
R22 (Harmful if swallowed.)
R36/37/38 (Irritating to eyes, respiratory system and skin.)
R42/43 (May cause sensitization by inhalation or by skin contact.)

16. Other Information

HMIS

Health	1
Flammability	0
Physical Hazard	1
Personal Protection (PPE)	J

Protection = J (Safety goggles, gloves, apron & combination dust & vapor respirator)
HMIS = Hazardous Materials Identification System

Degree of Hazard Code:
4 = Severe
3 = Serious
2 = Moderate
1 = Slight
0 = Minimal

NFPA

Health	1
Flammability	0
Physical Hazard	1
Special	OX

SPECIAL = OX (Oxidizer)

NFPA (National Fire Protection Association)

Degree of Hazard Code:
4 = Extreme
3 = High
2 = Moderate
1 = Slight

0 = Insignificant

Label Hazard Warning:
DANGER! CAUSES SEVERE IRRITATION. HARMFUL IF SWALLOWED OR INHALED. STRONG OXIDIZER. CONTACT WITH COMBUSTIBLE MATERIALS, FLAMMABLE MATERIALS, OR POWDERED METALS CAN CAUSE FIRE OR EXPLOSION. CAUSES EYE AND SKIN IRRITATION.

Label Precautions:
Keep from contact with clothing and other combustible materials. Do not store near combustible materials. Do not get in eyes, on skin, on clothing. Avoid breathing dust. Keep in tightly closed container. Use with adequate ventilation. Wash thoroughly after handling.

Label First Aid:
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Prompt action is essential. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Globally Harmonized System of Classification and Labeling of Chemicals (GHS Law)

Symbol	Symbol Word	Hazard Statement
	Danger	May cause fire or explosion; Strong oxidizer
	Warning	Harmful if swallowed (Oral) Harmful in contact with skin (dermal) Cause skin and eye irritation. Harmful if inhaled (gas, vapour, dust, mist)
	Danger	May cause allergy or asthma symptoms or breathing difficulties in inhaled

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