



SAFETY DATA SHEET

1. Identification

Product identifier	SULFURIC ACID
Other means of identification	
Product code	920044
CAS number	7664-93-9
Synonyms	Dihydrogen Sulfate; Oil of vitriol; Vitriol Brown Oil; Acide sulfurique; 60 Deg Technical; 66 Deg Technical; 93% Technical; 1.835 Electrolyte; 98 % Technical; 99 % Technical; 100 % Technical.
Recommended use	Industrial use. Water treatment chemical. Manufacture of pulp, paper and paper products. Fertilizer.
Recommended restrictions	-
Manufacturer/Importer/Supplier/Distributor information	
Manufacturer	NorFalco LLC, Three Stamford Plaza, 301 Tresser Boulevard, Stamford, Connecticut, 06901-3244, USA NorFalco Sales, a division of Glencore Canada Corporation, 100 King W., Toronto, ON, Canada, M5X 1E3. Noranda Income Limited Partnership (CEZinc), Salaberry-de-Valleyfield (Quebec)Canada J6T 6L4. Horne Smelter-A Glencore company, Rouyn-Noranda (Quebec) J9X 5B6. Brunswick Smelting-A Glencore company, Belledune, New Brunswick E0B 1 G0. Sudbury integrated Nickel Operations-A Glencore company, Falconbridge, Ontario POM 1SO.
Website	www.norfalco.com
Contact Point	General Office : 1-416-775-1400
E-mail address	NorfalcoTechnicalService@glencore-ca.com
Emergency Telephone	Glencore 24/24 7/7 : 1-760-476-3962 (333261)
Transportation Emergency Telephone	USA: 1-800-424-9300 CHEMTREC

2. Hazard(s) identification

Physical hazards	Not classified.	
Health hazards	Skin corrosion/irritation	Category 1A
	Serious eye damage/eye irritation	Category 1
OSHA defined hazards	Not classified.	

This SDS adheres to the regulatory requirements of the US OSHA Hazard Communication Standard, 29CFR 1910.1200.

Label elements



Signal word	Danger
Hazard statement	Causes severe skin burns and eye damage. Causes serious eye damage.

Precautionary statement

Prevention

Keep only in original packaging. Do not breathe mist or vapor. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection.

Response

If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If inhaled: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor. Wash contaminated clothing before reuse. Absorb spillage to prevent material-damage.

Storage

Store in a well-ventilated place. Keep container tightly closed. Store locked up. Store in a corrosion resistant container with a resistant inner liner.

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC)

None known.

Supplemental information

Not applicable.

3. Composition/information on ingredients

Substances

Chemical name	Common name and synonyms	CAS number	%
Sulfuric Acid		7664-93-9	77-100

Composition comments

All concentrations are in percent by weight. For more detailed chemical composition, refer to the certificate of analysis.

4. First-aid measures

Inhalation

Remove to fresh air and keep at rest in a position comfortable for breathing. Oxygen or artificial respiration if needed. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Call a physician or poison control center immediately.

Skin contact

Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician or poison control center immediately. Chemical burns must be treated by a physician. For minor skin contact, avoid spreading material on unaffected skin. Thoroughly wash (or discard) clothing and shoes before reuse.

Eye contact

Immediately flush with plenty of water. Remove any contact lenses and open eyelids wide apart. Call an ambulance and continue flushing during transportation to hospital taking along these instructions.

Ingestion

Call a physician or poison control center immediately. Rinse mouth thoroughly with water and give large amounts of milk or water, if person is conscious. Seek immediate medical attention. Do not induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Do not use mouth-to-mouth method if victim ingested the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Most important symptoms/effects, acute and delayed

Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. May cause respiratory irritation.

Indication of immediate medical attention and special treatment needed

Provide general supportive measures and treat symptomatically. Chemical burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. In case of shortness of breath, give oxygen. Symptoms may be delayed. Keep the affected person warm and at rest.

General information

Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Immediate medical attention is required. In case of shortness of breath, give oxygen.

5. Fire-fighting measures

Suitable extinguishing media

Foam. Powder. Carbon dioxide (CO₂). Water fog.

Unsuitable extinguishing media

Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical

Not flammable, but reacts with most metals to form flammable hydrogen gas. The product reacts with water and will generate heat. During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters	Self-contained breathing apparatus, operated in positive pressure mode and full protective clothing must be worn in case of fire.
Fire fighting equipment/instructions	Cool containers exposed to heat with water spray and remove container, if no risk is involved. Do not allow run-off from firefighting to enter drains or water courses.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	Material may react violently with water. Contact with moisture or water may generate sufficient heat to ignite nearby combustible materials. Containers can burst violently when heated, due to excess pressure build-up. Cool containers exposed to heat with water spray and remove container, if no risk is involved.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Ventilate closed spaces before entering them. Keep unnecessary personnel away. Wear protective clothing as described in Section 8 of this safety data sheet. Wear appropriate protective equipment and clothing during clean-up. Do not breathe mist or vapor. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	<p>Stop the flow of material, if this is without risk. This product is miscible in water. Should not be released into the environment. Prevent entry into waterways, sewer, basements or confined areas. Clean up in accordance with all applicable regulations.</p> <p>Large Spills: Absorb spillage to prevent material damage. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Following product recovery, flush area with water.</p> <p>Small Spills: Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Clean surface thoroughly to remove residual contamination.</p> <p>Flush residual spill area with a large amount of water. Neutralize washings or spill area with soda ash or lime.</p> <p>Never return spills to original containers for re-use. Put material in suitable, covered, labeled containers. For waste disposal, see section 13 of the SDS.</p>
Environmental precautions	Avoid release to the environment. Contact local authorities in case of spillage to drain/aquatic environment. Prevent further leakage or spillage if safe to do so. Do not contaminate water. Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling	Use only outdoors or in a well-ventilated area. Do not breathe mist or vapor. Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling. Avoid release to the environment. Never pour water into acid/base. Dilute by slowly pouring the product into water while stirring. Never add water to this product. When using, do not eat, drink or smoke. Observe good industrial hygiene practices. Wear appropriate personal protective equipment (See Section 8).
Conditions for safe storage, including any incompatibilities	Store in a place accessible by authorized persons only. Store locked up. Store in a cool, dry place out of direct sunlight. Store in corrosive resistant container with a resistant inner liner. Keep only in the original container. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Store away from incompatible materials (see Section 10 of the SDS). Keep away from combustible material. Do not store in unlabelled containers. Never allow product to get in contact with water during storage. Keep away from food, drink and animal feedingstuffs.

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Material	Type	Value
Sulfuric Acid (CAS 7664-93-9)	PEL	1 mg/m3

US. ACGIH Threshold Limit Values

Material	Type	Value	Form
Sulfuric Acid (CAS 7664-93-9)	TWA	0.2 mg/m3	Thoracic fraction.

US. NIOSH: Pocket Guide to Chemical Hazards

Material	Type	Value
Sulfuric Acid (CAS 7664-93-9)	TWA	1 mg/m3
Biological limit values	No biological exposure limits noted for the ingredient(s).	
Appropriate engineering controls	Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Eye wash facilities and emergency shower must be available when handling this product.	
Individual protection measures, such as personal protective equipment		
Eye/face protection	Wear safety glasses with side shields (or goggles) and a face shield.	
Skin protection		
Hand protection	Wear appropriate chemical resistant gloves. Neoprene, butyl rubber, nitrile or Viton gloves are recommended. Be aware that the liquid may penetrate the gloves. Frequent change is advisable. Suitable gloves can be recommended by the glove supplier.	
Skin protection		
Other	Do not get this material in contact with skin. Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended.	
Respiratory protection	Use a NIOSH/MSHA approved air purifying respirator as needed to control exposure. Consult with respirator manufacturer to determine respirator selection, use, and limitations. Use positive pressure, air-supplied respirator for uncontrolled releases or when air purifying respirator limitations may be exceeded. Follow respirator protection program requirements (OSHA 1910.134 and ANSI Z88.2) for all respirator use. Wear positive pressure self-contained breathing apparatus (SCBA).	
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.	
General hygiene considerations	Handle in accordance with good industrial hygiene and safety practice. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. When using, do not eat, drink or smoke. Follow up on any medical surveillance requirements.	

9. Physical and chemical properties

Appearance

Physical state	Liquid.
Form	Oily liquid. Clear to slightly turbid.
Color	Colorless to gray.
Odor	Odorless.
Odor threshold	Not available.
pH	< 1 (1% soln/water)
Melting point/freezing point	-31 - 52 °F (-35 - 11.11 °C)
Initial boiling point and boiling range	379 - 621 °F (192.78 - 327.22 °C)
Flash point	Not available.
Evaporation rate	< 1 (Butyl Acetate = 1)
Flammability (solid, gas)	Not applicable.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not applicable.
Flammability limit - upper (%)	Not applicable.
Vapor pressure	< 0.3 mm Hg (77°F/25°C) < 0.6 mm Hg (100°F/38°C)
Vapor density	3.4 (Air = 1)
Relative density	1.76 - 1.84

Solubility(ies)	
Solubility (water)	Miscible
Partition coefficient (n-octanol/water)	Not applicable.
Auto-ignition temperature	Not applicable.
Decomposition temperature	644 °F (340 °C)
Viscosity	13.6 mm ² /s (25 °C / 77 °F)
Other information	
Bulk density	Not applicable.
Dynamic viscosity	22.5 cP (20 °C / 68 °F)
Explosive properties	Not explosive.
Oxidizing properties	Oxidizing agent.
Percent volatile	15 % (Estimated)

10. Stability and reactivity

Reactivity	Reacts violently with strong alkaline substances. This product may react with reducing agents. May be corrosive to metals. The product reacts with water and will generate heat.
Chemical stability	Stable at normal conditions.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Excessive heat. Moisture. Do not mix with other chemicals. Contact with incompatible materials.
Incompatible materials	Water. Never add water to this product. Bases. Strong oxidizing agents. Strong reducing agents. Metals. Organic material.
Hazardous decomposition products	Sulfur oxides (SOx.).

11. Toxicological information

Information on likely routes of exposure

Inhalation	Corrosive. Inhalation produces damaging effects on the mucous membranes and upper respiratory tract. May cause irritation to the respiratory system. Inhalation of vapors may cause lung oedema.
Skin contact	Causes severe skin burns.
Eye contact	Causes serious eye damage.
Ingestion	Causes digestive tract burns.
Symptoms related to the physical, chemical and toxicological characteristics	Contact with this material will cause burns to the skin, eyes and mucous membranes. Burning pain and severe corrosive skin damage. Causes serious eye damage. Contact can cause corrosive burns, corneal damage, and blindness. Permanent eye damage including blindness could result. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. May cause respiratory irritation.

Information on toxicological effects

Acute toxicity	Causes severe burns. May be harmful if swallowed. Vapors are corrosive. After some hours, injured persons may develop serious shortness of breath and lung edema.
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Product	Species	Test Results
Sulfuric Acid (CAS 7664-93-9)		
<u>Acute</u>		
Inhalation		
<i>Mist</i>		
LC50	Rat	0.375 mg/l, 4 hours
Oral		
LD50	Rat	2140 mg/kg
Skin corrosion/irritation	Corrosive to skin and eyes. Causes severe skin burns and eye damage.	
Serious eye damage/eye irritation	Corrosive to skin and eyes. Causes serious eye damage. Effects of exposure on eye may include pain, redness, severe deep burns and loss of vision.	
Respiratory or skin sensitization		
Respiratory sensitization	Based on available data, the classification criteria are not met.	

Skin sensitization	Not a skin sensitizer.
Germ cell mutagenicity	Test data conclusive but not sufficient for classification.
Carcinogenicity	Exposure to strong inorganic acid mists containing sulfuric acid has been classified as carcinogenic to humans. The International Agency for Research on Cancer (IARC) has classified "strong inorganic acid mists containing sulfuric acid" as a known human carcinogen, (IARC category 1). This classification applies only to mists containing sulfuric acid and not to sulfuric acid or sulfuric acid solutions.

IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

NTP Report on Carcinogens

Sulfuric Acid (CAS 7664-93-9)

Known To Be Human Carcinogen.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

Reproductive toxicity	Test data conclusive but not sufficient for classification.
Specific target organ toxicity - single exposure	May cause respiratory irritation.
Specific target organ toxicity - repeated exposure	Test data conclusive but not sufficient for classification.
Aspiration hazard	Not classified.
Chronic effects	Prolonged inhalation may be harmful. Sulfuric acid fumes: Prolonged, repeated exposure to acid fumes/mists may cause chronic bronchitis, irritation of skin, mucous membranes and gastrointestinal tract and erosion of the teeth.
Further information	Be aware that symptoms of lung edema (shortness of breath) may develop up to 24 hours after exposure.

12. Ecological information

Ecotoxicity	Because of the low pH of this product, it would be expected to produce significant ecotoxicity upon exposure to aquatic organisms and aquatic systems. The product may affect the acidity (pH-factor) in water with risk of harmful effects to aquatic organisms.
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Product	Species		Test Results
Sulfuric Acid (CAS 7664-93-9)			
Aquatic			
Algae	EC50	Pseudokirchneriella subcapitata	> 100 mg/l, 72 hours
Crustacea	EC50	Daphnia magna	29 mg/l, 24 hours
Fish	LC50	Lepomis macrochirus	16 - 28 mg/l, 96 hours
Persistence and degradability	The product is not biodegradable.		
Bioaccumulative potential	The product is not bioaccumulating.		
Mobility in soil	This product is water soluble and may disperse in soil.		
Mobility in general	The product is water soluble and may spread in water systems.		
Other adverse effects	The product may affect the acidity (pH-factor) in water with risk of harmful effects to aquatic organisms.		

13. Disposal considerations

Disposal instructions	This material and its container must be disposed of as hazardous waste. Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations.
Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	D002: Waste Corrosive material [pH ≤2 or ≥12.5, or corrosive to steel] The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers retain product residue, follow label warnings even after container is emptied.
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14. Transport information

DOT	
UN number	UN1830
UN proper shipping name	Sulfuric acid
Transport hazard class(es)	
Class	8
Subsidiary risk	-
Label(s)	8
Packing group	II
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Special provisions	A3, A7, B3, B83, B84, IB2, N34, T8, TP2, TP12
Packaging exceptions	154
Packaging non bulk	202
Packaging bulk	242
DOT BULK	
BULK	
UN number	UN1830
UN proper shipping name	Sulfuric acid
Transport hazard class(es)	
Class	8
Label(s)	8
Packing group	II
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Special provisions	A3, A7, B3, B83, B84, IB2, N34, T8, TP2, TP12
Packaging exceptions	154
Packaging non bulk	202
Packaging bulk	242
IATA	
UN number	UN1830
UN proper shipping name	Sulfuric acid
Transport hazard class(es)	
Class	8
Subsidiary risk	-
Packing group	II
Environmental hazards	No.
ERG Code	8L
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
IMDG	
UN number	UN1830
UN proper shipping name	SULFURIC ACID
Transport hazard class(es)	
Class	8
Subsidiary risk	-
Packing group	II
Environmental hazards	
Marine pollutant	No.
EmS	F-A, S-B
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	This product is a liquid and when transported in bulk is covered under MARPOL 73/78 Annex II. This product is listed in the IBC Code. Ship type: 3 Pollution category: Y

15. Regulatory information

US federal regulations

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.
Additional information is given in the Safety Data Sheet.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Sulfuric Acid (CAS 7664-93-9) LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Immediate Hazard - Yes
Delayed Hazard - No
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Chemical name	CAS number	Reportable quantity (pounds)	Threshold planning quantity (pounds)	Threshold planning quantity, lower value (pounds)	Threshold planning quantity, upper value (pounds)
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Sulfuric Acid	7664-93-9	1000	1000		
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SARA 311/312 Hazardous chemical Yes

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
Sulfuric Acid	7664-93-9	77-100

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Sulfuric Acid (CAS 7664-93-9)

Clean Water Act (CWA) Hazardous substance
Section 112(r) (40 CFR 68.130)

Safe Drinking Water Act (SDWA) Not regulated.

Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2) and Chemical Code Number

Sulfuric Acid (CAS 7664-93-9) 6552

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

Sulfuric Acid (CAS 7664-93-9) 20 %WV

DEA Exempt Chemical Mixtures Code Number

Sulfuric Acid (CAS 7664-93-9) 6552

Food and Drug Administration (FDA) Total food additive
Direct food additive
GRAS food additive

US state regulations

WARNING: This product contains a chemical known to the State of California to cause cancer.

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Sulfuric Acid (CAS 7664-93-9)

US. Massachusetts RTK - Substance List

Sulfuric Acid (CAS 7664-93-9)

US. New Jersey Worker and Community Right-to-Know Act

Sulfuric Acid (CAS 7664-93-9)

US. Pennsylvania Worker and Community Right-to-Know Law

Sulfuric Acid (CAS 7664-93-9)

US. Rhode Island RTK

Sulfuric Acid (CAS 7664-93-9)

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date 20-January-2017

Revision date -

Version # 01

HMIS® ratings Health: 3
Flammability: 0
Physical hazard: 4

List of abbreviations LD50: Lethal Dose, 50%.
LC50: Lethal Concentration, 50%.
EC50: Effective Concentration, 50%.
PEL: Permissible Exposure Limit.
TWA: Time weighted average.

References IUCLID
EPA: AQUIRE database
NLM: Hazardous Substances Data Base
US. IARC Monographs on Occupational Exposures to Chemical Agents
National Toxicology Program (NTP) Report on Carcinogens
ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices
HSDB® - Hazardous Substances Data Bank

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