SAFETY DATA SHEET

Creation Date 22-Sep-2009 **Revision Date** 24-May-2017 **Revision Number** 3

1. Identification

Product Name **Molybdenum Reference Standard Solution**

Cat No. : **SM113-100 ; SM113-500**

Synonyms None

Recommended Use Laboratory chemicals.
Uses advised against Not for food, drug, pesticide or biocidal product use

Details of the supplier of the safety data sheet

Company
Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Emergency Telephone Number
CHEMTREC®, Inside the USA: 800-424-9300
CHEMTREC®, Outside the USA: 001-703-527-3887

2. Hazard(s) identification

Classification
Classification under 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Based on available data, the classification criteria are not met

Label Elements
None required

Hazards not otherwise classified (HNOC)
None identified

3. Composition / information on ingredients

Component	CAS-No	Weight %
Water	7732-18-5	99.7
Molybdenum trioxide	1313-27-5	0.15
Hydrogen chloride	7647-01-0	0.06
Nitric acid	7697-37-2	0.04

4. First-aid measures

Eye Contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Obtain medical attention.
Skin Contact	Wash off immediately with plenty of water for at least 15 minutes. Get medical attention immediately if symptoms occur.
Inhalation	Move to fresh air. Get medical attention immediately if symptoms occur.
Ingestion	Clean mouth with water and drink afterwards plenty of water. Get medical attention if symptoms occur.
Most important symptoms/effects	None reasonably foreseeable.
Notes to Physician	Treat symptomatically

5. Fire-fighting measures

Unsuitable Extinguishing Media	No information available
Flash Point	Not applicable
Method -	No information available
Autoignition Temperature	No information available
Explosion Limits	
Upper	No data available
Lower	No data available
Sensitivity to Mechanical Impact	No information available
Sensitivity to Static Discharge	No information available

Specific Hazards Arising from the Chemical
Keep product and empty container away from heat and sources of ignition.

Hazardous Combustion Products
Hydrogen chloride gas Nitrogen oxides (NOx)
Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health	Flammability	Instability	Physical hazards
1	0	0	N/A

6. Accidental release measures

Personal Precautions	Ensure adequate ventilation. Use personal protective equipment.
Environmental Precautions	Should not be released into the environment.
Methods for Containment and Clean Up	Sweep up or vacuum up spillage and collect in suitable container for disposal.

7. Handling and storage

Handling	Ensure adequate ventilation. Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Avoid ingestion and inhalation.
Storage	Keep containers tightly closed in a dry, cool and well-ventilated place.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
Molybdenum trioxide	TWA: 10 mg/m³ TWA: 3 mg/m³	(Vacated) TWA: 10 mg/m³	IDLH: 5000 mg/m³	TWA: 10 mg/m³ STEL: 20 mg/m³
Hydrogen chloride	Ceiling: 2 ppm	Ceiling: 5 ppm Ceiling: 7 mg/m³ (Vacated) Ceiling: 5 ppm (Vacated) Ceiling: 7 mg/m³	IDLH: 50 ppm Ceiling: 5 ppm Ceiling: 7 mg/m³	Ceiling: 5 ppm Ceiling: 7 mg/m³
Nitric acid	TWA: 2 ppm STEL: 4 ppm	(Vacated) TWA: 2 ppm (Vacated) TWA: 5 mg/m³ (Vacated) STEL: 4 ppm (Vacated) STEL: 10 mg/m³ TWA: 2 ppm TWA: 5 mg/m³	IDLH: 25 ppm TWA: 2 ppm TWA: 5 mg/m³ STEL: 4 ppm STEL: 10 mg/m³	TWA: 2 ppm TWA: 5 mg/m³ STEL: 4 ppm STEL: 10 mg/m³

Legend

ACGIH - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration
NIOSH IDLH: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health

Engineering Measures None under normal use conditions.

Personal Protective Equipment

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory Protection No protective equipment is needed under normal use conditions.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Colorless
Odor	Odorless
Odor Threshold	No information available
pH	No information available
Melting Point/Range	0 °C / 32 °F
Boiling Point/Range	100 °C / 212 °F
Flash Point	Not applicable
Evaporation Rate	> 1 (Ether = 1.0)
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	No data available
Lower	No data available
Vapor Pressure	14 mmHg @ 20 °C
Vapor Density	0.7
Specific Gravity	1.0
Solubility	miscible
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	No information available
Decomposition Temperature	No information available
Viscosity	No information available

10. Stability and reactivity

Reactive Hazard None known, based on information available

Stability Stable under normal conditions.

Conditions to Avoid Incompatible products.

Incompatible Materials Strong oxidizing agents

Hazardous Decomposition Products Hydrogen chloride gas, Nitrogen oxides (NOx)

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information No acute toxicity information is available for this product

Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Water	-	Not listed	Not listed
Molybdenum trioxide	2689 mg/kg (Rat) 188 mg/kg (Rat)	>2 g/kg (Rat)	>5840 mg/m³ (Rat) 4 h
Hydrogen chloride	LD50 238 - 277 mg/kg (Rat)	LD50 > 5010 mg/kg (Rabbit)	LC50 = 1.68 mg/L (Rat) 1 h
Nitric acid	Not listed	Not listed	LC50 = 2500 ppm. (Rat) 1h

Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation May cause eye, skin, and respiratory tract irritation

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Water	7732-18-5	Not listed	Not listed	Not listed	Not listed	Not listed
Molybdenum trioxide	1313-27-5	Not listed	Not listed	Not listed	Not listed	Not listed
Hydrogen chloride	7647-01-0	Not listed	Not listed	Not listed	Not listed	Not listed
Nitric acid	7697-37-2	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure None known

STOT - repeated exposure None known

Aspiration hazard No information available

Symptoms / effects,both acute and delayed No information available

Endocrine Disruptor Information No information available

Other Adverse Effects The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity

Do not empty into drains. Do not flush into surface water or sanitary sewer system.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Molybdenum trioxide	Not listed	Pimephales promelas: LC50=678 mg/L 96h	Not listed	Not listed
Hydrogen chloride	Not listed	LC50: = 282 mg/L, 96h static (Gambusia affinis)	Not listed	Not listed
Nitric acid	Not listed	LC50: = 72 mg/L, 96h (Gambusia affinis)	Not listed	Not listed

Persistence and Degradability Miscible with water Persistence is unlikely based on information available.

Bioaccumulation/ Accumulation No information available.

Mobility . Will likely be mobile in the environment due to its water solubility.

Component	log Pow
Nitric acid	-2.3

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information

DOT Not regulated
TDG Not regulated
IATA Not regulated
IMDG/IMO Not regulated

15. Regulatory information

All of the components in the product are on the following Inventory lists: X = listed

International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
Water	X	X	-	231-791-2	-		X	-	X	X	X
Molybdenum trioxide	X	X	-	215-204-7	-		X	X	X	X	X
Hydrogen chloride	X	X	-	231-595-7	-		X	X	X	X	X
Nitric acid	X	X	-	231-714-2	-		X	X	X	X	X

Legend:
X - Listed
E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.
F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.
N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.
P - Indicates a commenced PMN substance
R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.
S - Indicates a substance that is identified in a proposed or final Significant New Use Rule
T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.
XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B).
Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.
Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b) Not applicable

SARA 313

Component	CAS-No	Weight %	SARA 313 - Threshold Values %
Molybdenum trioxide	1313-27-5	0.15	1.0
Hydrogen chloride	7647-01-0	0.06	1.0
Nitric acid	7697-37-2	0.04	1.0

SARA 311/312 Hazard Categories

Acute Health Hazard	No
Chronic Health Hazard	No
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants
Hydrogen chloride	X	5000 lb	-	-
Nitric acid	X	1000 lb	-	-

Clean Air Act

Component	HAPS Data	Class 1 Ozone Depletors	Class 2 Ozone Depletors
Hydrogen chloride	X		-

OSHA Occupational Safety and Health Administration
Not applicable

Component	Specifically Regulated Chemicals	Highly Hazardous Chemicals
Hydrogen chloride	-	TQ: 5000 lb
Nitric acid	-	TQ: 500 lb

CERCLA
Not applicable

Component	Hazardous Substances RQs	CERCLA EHS RQs
Hydrogen chloride	5000 lb	5000 lb
Nitric acid	1000 lb	1000 lb

California Proposition 65 This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Water	-	-	X	-	-
Molybdenum trioxide	X	X	X	-	-
Hydrogen chloride	X	X	X	X	X
Nitric acid	X	X	X	X	X

U.S. Department of Transportation

Reportable Quantity (RQ):	N
DOT Marine Pollutant	N
DOT Severe Marine Pollutant	N

U.S. Department of Homeland Security
This product does not contain any DHS chemicals.

Component	DHS Chemical Facility Anti-Terrorism Standard
Hydrogen chloride	0 lb STQ (anhydrous); 11250 lb STQ (37% concentration or greater)
Nitric acid	2000 lb STQ

Other International Regulations

Mexico - Grade No information available

16. Other information

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Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of SDS