SAFETY DATA SHEET
COBALT-TUNGSTEN

1. Identification

Product identifier

Product name COBALT-TUNGSTEN

Recommended use of the chemical and restrictions on use

Application Industrial Use

Details of the supplier of the safety data sheet

Supplier

Stanford Advanced Materials
Address : 23661 Birtcher Dr.,
Lake Forest, CA 92630 U.S.A.
Tel: (949) 407-8904
Fax: (949) 812-6690

Email: sales@samaterials.com

Emergency telephone number **(949) 407-8904**

Emergency telephone **(This telephone number is available 24 hours per day, 7 days per week.)**

2. Hazard(s) identification

Classification of the substance or mixture

Physical hazards Not Classified

Health hazards Skin Corr. 1A - H314 Eye Dam. 1 - H318 Resp. Sens. 1 - H334 Skin Sens. 1 - H317 Muta. 2 - H341 Carc. 1B - H350 Repr. 1B - H360

Environmental hazards Aquatic Acute 1 - H400 Aquatic Chronic 1 - H410

Label elements

Pictogram

Signal word Danger

Hazard statements

H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H341 Suspected of causing genetic defects.
H350 May cause cancer.
H360 May damage fertility or the unborn child.
H410 Very toxic to aquatic life with long lasting effects.

COBALT-TUNGSTEN

Precautionary statements

P260 Do not breathe vapor/ spray.
P264 Wash contaminated skin thoroughly after handling.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P284 [In case of inadequate ventilation] wear respiratory protection.
P302+P352 If on skin: Wash with plenty of water.
P304+P340 If inhaled: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P501 Dispose of contents/ container in accordance with national regulations.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.
P270 Do not eat, drink or smoke when using this product.
P301+P310 If swallowed: Immediately call a poison center/ doctor.

Contains COBALT SULPHATE, 5.5%, COBALT CITRATE

Other hazards

This product does not contain any substances classified as PBT or vPvB.

3. Composition/information on ingredients

Mixtures

COBALT SULPHATE **5-10%**

CAS number: 10124-43-3

M factor (Acute) = 10 M factor (Chronic) = 10

Classification
Acute Tox. 4 - H302
Eye Irrit. 2A - H319
Resp. Sens. 1 - H334
Skin Sens. 1 - H317
Muta. 2 - H341
Carc. 1B - H350i
Repr. 1B - H360F
Aquatic Acute 1 - H400
Aquatic Chronic 1 - H410

ACETIC ACID 5.5% **5-10%**

CAS number: 64-19-7

Classification
Flam. Liq. 3 - H226
Skin Corr. 1A - H314
Eye Dam. 1 - H318

SODIUM TUNGSTATE **1-5%**

CAS number: 10213-10-2

Classification
Acute Tox. 4 - H302

COBALT-TUNGSTEN

COBALT CITRATE	1-5%
CAS number: 866-81-9	

Classification
Acute Tox. 4 - H302
Eye Dam. 1 - H318
Resp. Sens. 1 - H334
Skin Sens. 1 - H317
Muta. 2 - H341
Carc. 1B - H350
Repr. 1B - H360
Aquatic Chronic 2 - H411

CITRIC ACID	1-5%
CAS number: 77-92-9	

Classification
Eye Irrit. 2 - H319

The full text for all hazard statements is displayed in Section 16.

4. First-aid measures

Description of first aid measures

Inhalation Move affected person to fresh air and keep warm and at rest in a position comfortable for breathing. Never give anything by mouth to an unconscious person. Get medical attention.

Ingestion Do not induce vomiting. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Skin Contact Remove contaminated clothing immediately and wash skin with soap and water. Continue to rinse for at least 15 minutes and get medical attention.

Eye contact Remove affected person from source of contamination. Rinse immediately with plenty of water. Continue to rinse for at least 15 minutes and get medical attention.

Most important symptoms and effects, both acute and delayed

Inhalation Coughing, chest tightness, feeling of chest pressure.

Ingestion May cause chemical burns in mouth and throat. May cause stomach pain or vomiting.

Skin contact May cause serious chemical burns to the skin.

Eye contact Causes severe burns. May cause serious eye damage.

Indication of immediate medical attention and special treatment needed

Notes for the doctor No specific recommendations.

5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media The product is not flammable. Use fire-extinguishing media suitable for the surrounding fire.

Special hazards arising from the substance or mixture

Specific hazards Toxic and corrosive gases or vapors.

Advice for firefighters

COBALT-TUNGSTEN

Protective actions during firefighting Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing.

Special protective equipment for firefighters Use protective equipment appropriate for surrounding materials.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal precautions Follow precautions for safe handling described in this safety data sheet. Avoid inhalation of vapors. Provide adequate general and local exhaust ventilation.

Environmental precautions

Environmental precautions Do not discharge into drains or watercourses or onto the ground. Inform the relevant authorities if environmental pollution occurs (sewers, waterways, soil or air).

Methods and material for containment and cleaning up

Methods for cleaning up Wear suitable protective equipment, including gloves, goggles/face shield, respirator, boots, clothing or apron, as appropriate. Flush contaminated area with plenty of water. Avoid the spillage or runoff entering drains, sewers or watercourses. Collect and dispose of spillage as indicated in Section 13. Wash thoroughly after dealing with a spillage.

Reference to other sections Wear protective clothing as described in Section 8 of this safety data sheet. See Section 11 for additional information on health hazards. See Section 12 for additional information on ecological hazards. For waste disposal, see Section 13.

7. Handling and storage

Precautions for safe handling

Usage precautions Avoid spilling. Avoid contact with skin and eyes. Avoid inhalation of vapors and spray/mists. Provide adequate general and local exhaust ventilation.

Conditions for safe storage, including any incompatibilities

Storage precautions Store in tightly-closed, original container in a dry, cool and well-ventilated place. Protect from freezing and direct sunlight.

Storage class Toxic storage. Corrosive storage.

Specific end uses(s)

Specific end use(s) The identified uses for this product are detailed in Section 1.

8. Exposure Controls/personal protection

Control parameters

Occupational exposure limits

ACETIC ACID 5.5%

Long-term exposure limit (8-hour TWA): ACGIH 10 ppm 25 mg/m³
Long-term exposure limit (8-hour TWA): OSHA 10 ppm 25 mg/m³
Short-term exposure limit (15-minute): ACGIH 15 ppm 37 mg/m³
ACGIH = American Conference of Governmental Industrial Hygienists.
OSHA = Occupational Safety and Health Administration.

Exposure controls

COBALT-TUNGSTEN

Protective equipment

Appropriate engineering controls	As this product contains ingredients with exposure limits, process enclosures, local exhaust ventilation or other engineering controls should be used to keep worker exposure below any statutory or recommended limits, if use generates dust, fumes, gas, vapor or mist.
Eye/face protection	Tight-fitting safety glasses.
Hand protection	It is recommended that chemical-resistant, impervious gloves are worn. Considering the data specified by the glove manufacturer, check during use that the gloves are retaining their protective properties and change them as soon as any deterioration is detected. It is recommended that gloves are made of the following material: Nitrile rubber.
Other skin and body protection	Appropriate footwear and additional protective clothing complying with an approved standard should be worn if a risk assessment indicates skin contamination is possible.
Hygiene measures	Do not eat, drink or smoke when using this product. Wash at the end of each work shift and before eating, smoking and using the toilet.
Respiratory protection	If ventilation is inadequate, suitable respiratory protection must be worn. Respiratory protection must be used if the airborne contamination exceeds the recommended occupational exposure limit.

9. Physical and Chemical Properties

Information on basic physical and chemical properties

Appearance	Liquid.
Color	Red.
Odor	No characteristic odor.
pH	pH (concentrated solution): 2.0-3.1
Relative density	1.241-1.246 @ 20°C
Other information	Not available.
Volatile organic compound	This product contains a maximum VOC content of ACETIC ACID 7 g/l.

10. Stability and reactivity

Reactivity	There are no known reactivity hazards associated with this product.
Stability	Stable at normal ambient temperatures and when used as recommended.
Possibility of hazardous reactions	Not determined.
Conditions to avoid	Avoid excessive heat for prolonged periods of time.
Materials to avoid	Strong alkalis.
Hazardous decomposition products	None at ambient temperatures.

11. Toxicological information

COBALT-TUNGSTEN

Information on toxicological effects

Acute toxicity - oral

ATE oral (mg/kg)	3,676.47

Inhalation	Vapor from this product may be hazardous by inhalation.
Ingestion	Toxic if swallowed. Causes severe burns. May cause chemical burns in mouth, esophagus and stomach.
Skin Contact	Product has a defatting effect on skin. May cause allergic contact eczema. May cause sensitisation by skin contact.
Eye contact	Causes serious eye damage. Immediate first aid is imperative.
Acute and chronic health hazards	Known or suspected carcinogen for humans.
Route of entry	Ingestion Inhalation Skin and/or eye contact

Toxicological information on ingredients.

COBALT SULPHATE

Acute toxicity - oral

Acute toxicity oral (LD_{50} mg/kg)	768.0
Species	Rat
ATE oral (mg/kg)	500.0

Acute toxicity - dermal

Acute toxicity dermal (LD_{50} mg/kg)	2,000.0
Species	Rat
ATE dermal (mg/kg)	2,000.0

Carcinogenicity

NTP carcinogenicity	Reasonably anticipated to be a human carcinogen.

ACETIC ACID 5.5%

Acute toxicity - oral

Acute toxicity oral (LD_{50} mg/kg)	3,310.0
Species	Rat
ATE oral (mg/kg)	3,310.0

Acute toxicity - dermal

Acute toxicity dermal (LD_{50} mg/kg)	1,060.0
Species	Rabbit

SODIUM TUNGSTATE

COBALT-TUNGSTEN

Acute toxicity - oral

Acute toxicity oral (LD_{50} mg/kg)	1.19
Species	Rat
ATE oral (mg/kg)	500.0

Acute toxicity - inhalation

Acute toxicity inhalation (LC_{50} dust/mist mg/l)	5.01
Species	Rat
ATE inhalation (dusts/mists mg/l)	5.01

COBALT CITRATE

Acute toxicity - oral

ATE oral (mg/kg)	500.0

CITRIC ACID

Acute toxicity - oral

Acute toxicity oral (LD_{50} mg/kg)	11,700.0
Species	Rabbit

12. Ecological Information

Ecotoxicity The product contains a substance which may have hazardous effects on the environment.

Toxicity No data available.

Ecological information on ingredients.

COBALT SULPHATE

Acute aquatic toxicity

LE(C)$_{50}$	0.01 < L(E)C50 ≤ 0.1
M factor (Acute)	10
Acute toxicity - fish	LC_{50}, : 1.5 ug/l, Freshwater fish
Acute toxicity - aquatic invertebrates	LC_{50}, : 0.61 mg/l, Freshwater invertebrates
Acute toxicity - microorganisms	LC_{50}, : 144 ug/l, Freshwater fish LC_{50}, : 24.1 ug/l, Sea water

Chronic aquatic toxicity

M factor (Chronic)	10
Chronic toxicity - fish early life stage	EC10, 351.4 : mg/l, Freshwater fish

COBALT-TUNGSTEN

SODIUM TUNGSTATE

Acute toxicity - fish , 48 hour: 89.4 mg/l, Daphnia magna

CITRIC ACID

Acute toxicity - fish LC_{50}, 96 hour: 440-706 mg/l, Carassius auratus (Goldfish)

Persistence and degradability

Persistence and degradability No data available.

Bioaccumulative potential

Bio-Accumulative Potential The product does not contain any substances expected to be bioaccumulating.

Ecological information on ingredients.

COBALT SULPHATE

Bio-Accumulative Potential BCF: < 10, Freshwater fish BCF: < 10, Marinewater fish Not bioaccumulative in the aquatic environment.

Mobility in soil

Mobility The product is soluble in water.

Other adverse effects

Other adverse effects Not determined.

13. Disposal considerations

Waste treatment methods

General information Disposal of this product, process solutions, residues and by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any local authority requirements.

14. Transport information

UN Number

UN No. (TDG) 3082

UN No. (IMDG) 3082

UN No. (ICAO) 3082

UN No. (DOT) 3082

UN proper shipping name

Proper shipping name (TDG) ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (COBALT SULPHATE)

Proper shipping name (IMDG) ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (COBALT SULPHATE)

Proper shipping name (ICAO) ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (COBALT SULPHATE)

Proper shipping name (DOT) ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (COBALT SULPHATE)

Transport hazard class(es)

TDG class 9

TDG label(s) 9

IMDG Class 9

COBALT-TUNGSTEN

ICAO class/division 9

Transport labels

Packing group

TDG Packing Group III

IMDG packing group III

ICAO packing group III

DOT packing group III

Environmental hazards

Environmentally Hazardous Substance

Special precautions for user

EmS F-A, S-F

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code No information required.

15. Regulatory information

US Federal Regulations

SARA Section 302 Extremely Hazardous Substances Tier II Threshold Planning Quantities

Exempt.

CERCLA/Superfund, Hazardous Substances/Reportable Quantities (EPA)

Acetic Acid
Final CERCLA RQ: 5000 lbs

SARA Extremely Hazardous Substances EPCRA Reportable Quantities

Exempt.

SARA 313 Emission Reporting

Cobalt Citrate
Cobalt Sulphate

CAA Accidental Release Prevention

HAP
Cobalt Citrate
Cobalt Sulphate

SARA (311/312) Hazard Categories

Acute
Chronic

OSHA Highly Hazardous Chemicals

Exempt.

COBALT-TUNGSTEN

US State Regulations

California Proposition 65 Carcinogens and Reproductive Toxins

Cobalt Citrate
Cobalt Sulphate

California Directors List of Hazardous Substances

Acetic Acid

Inventories

US - TSCA

All ingredients are present.

16. Other information

Classification abbreviations and acronyms	Acute Tox. = Acute toxicity Carc. = Carcinogenicity Eye Dam. = Serious eye damage Eye Irrit. = Eye irritation Flam. Liq. = Flammable liquid Muta. = Germ cell mutagenicity Repr. = Reproductive toxicity Resp. Sens. = Respiratory sensitisation Skin Corr. = Skin corrosion Skin Irrit. = Skin irritation Skin Sens. = Skin sensitisation STOT RE = Specific target organ toxicity-repeated exposure STOT SE = Specific target organ toxicity-single exposure
Revision date	6/1/2018
Revision	3
Hazard statements in full	H226 Flammable liquid and vapor. H302 Harmful if swallowed. H314 Causes severe skin burns and eye damage. H317 May cause an allergic skin reaction. H318 Causes serious eye damage. H319 Causes serious eye irritation. H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled. H341 Suspected of causing genetic defects. H350 May cause cancer. H350i May cause cancer by inhalation. H360 May damage fertility or the unborn child. H360F May damage fertility. H400 Very toxic to aquatic life. H410 Very toxic to aquatic life with long lasting effects. H411 Toxic to aquatic life with long lasting effects.
NFPA - instability hazard	Normally stable. (0)
NFPA - health hazard	Temporary incapacitation, injury. (2)
NFPA - flammability hazard	Will not burn. (0)

COBALT-TUNGSTEN