

Safety Data Sheet per OSHA HazCom 2012

1 Identification Product identifier Product name: Thulium(III) sulfate octahydrate Stock number: A17296 CAS Number: 13778-40-0 EC number: 243-996-4 Relevant identified uses of the substance or mixture and uses advised against. Identified use: SU24 Scientific research and development Details of the supplier of the safety data sheet Manufacturer/Supplier: Alfa Aesar Thermo Fisher Scientific Chemicals, Inc. Inerrito Fisher Scheman C. 30 Bond Street Ward Hill, MA 01835-8099 Tel: 800-343-0660 Fax: 800-322-4757 Email: tech @alfa.com www.alfa.com Information Department: Health, Safety and Environmental Department Emergency telephone number: During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660. After normal business hours, call Carechem 24 at (866) 928-0789. 2 Hazard(s) identification Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS) ! GHS07 Skin Irrit. 2 H315 Causes skin irritation. Eye Irrit. 2A H319 Causes serious eye irritation. STOT SE 3 H335 May cause respiratory irritation. Hazards not otherwise classified No information known. Label elements GHS label elements The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS) Hazard pictograms GHS07 Signal word Warning Hazard statements H315 Causes skin irritation. H319 Causes serious eye irritation. H335 May cause respiratory irritation. Precautionary statements P261 Avoid breathing dust/fume/gas/mist/vapours/spray. P280 Wear protective gloves/protective clothing/eye protection/face protection. P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Store locked up. Dispose of contents/container in accordance with local/regional/national/international regulations. P405 WHMIS classification D2B - Toxic material causing other toxic effects Ţ Classification system HMIS ratings (scale 0-4) (Hazardous Materials Identification System) Health (acute effects) = 10 Flammàbility = 0 TIVITY 1 Physical Hazard = 1 Other hazards Results of PBT and vPvB assessment PBT: Not applicable. vPvB: Not applicable 3 Composition/information on ingredients Chemical characterization: Substances CAS# Description: 13778-40-0 Thulium(III) sulfate octahydrate Identification number(s): EC number: 243-996-4 4 First-aid measures Description of first aid measures After inhalation Supply fresh air. If required, provide artificial respiration. Keep patient warm. Seek immediate medical advice. After skin contact Immediately wash with water and soap and rinse thoroughly. (Contd. on page 2)

		viewed 011 03/10/2009
Product name: Thulium(III) sulfa	te octahydrate	
Seek immediate medical advice.		(Contd. of page 1)
	ve for several minutes under running water. Then consult a doctor.	
Information for doctor	fects, both acute and delayed No further relevant information available.	
Indication of any immediate medi	ical attention and special treatment needed No further relevant information available.	
5 Fire-fighting measures		
Extinguishing media Suitable extinguishing agents Pro	oduct is not flammable. Use fire-fighting measures that suit the surrounding fire.	
Special hazards arising from the	substance or mixture	
If this product is involved in a fire, th Sulfur oxides (SOx) Metal oxide fume		
Advice for firefighters Protective equipment:		
Wear self-contained respirator. Wear fully protective impervious su	it.	
6 Accidental release measures		
Personal precautions, protective	equipment and emergency procedures	
Wear protective equipment. Keep u Ensure adequate ventilation		
Environmental precautions: Do n Methods and material for contain	ot allow material to be released to the environment without proper governmental permits. ment and cleaning up: Ensure adequate ventilation.	
Prevention of secondary hazards Reference to other sections		
See Section 7 for information on sa See Section 8 for information on pe	ersonal protection equipment.	
See Section 13 for disposal informa	tion.	
7 Handling and storage		
Handling Precautions for safe handling		
Keep container tightly sealed. Store in cool, dry place in tightly clo	sed containers.	
Ensure good ventilation at the work Information about protection aga	place. inst explosions and fires: The product is not flammable	
Conditions for safe storage, inclu Storage	iding any incompatibilities	
Requirements to be met by store	rooms and receptacles: No special requirements.	
Information about storage in one Store away from oxidizing agents.	common storage racinty.	
Store away from water/moisture.	e conditions:	
This product is hygroscopic. Store under dry inert gas.		
Keep container tightly sealed. Store in cool, dry conditions in well Protect from humidity and water.	sealed containers.	
Specific end use(s) No further rele	evant information available.	
8 Exposure controls/personal p		
Additional information about des	ign of technical systems: lood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.	
Control parameters		
Components with limit values that Additional information: No data	at require monitoring at the workplace: Not required.	
Exposure controls Personal protective equipment		
General protective and hygienic i	measures for handling chemicals should be followed.	
Keep away from foodstuffs, beverag Remove all soiled and contaminate	ges and feed.	
Wash hands before breaks and at t Avoid contact with the eyes and ski	he end of work.	
Maintain an ergonomically appropria	ate working environment.	
Protection of hands: Impervious gloves	e respirator when high concentrations are present.	
Check protective gloves prior to eac	ch use for their proper condition. only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.	
Penetration time of glove materia Eye protection: Safety glasses	il (in minutes) Not determined	
Body protection: Protective work of	clothing.	
9 Physical and chemical proper	rties	
Information on basic physical and General Information	d chemical properties	
Appearance: Form:	Powder	
Color: Odor:	Light green Not determined	
Odor threshold:	Not determined.	
pH-value: Change in condition	Not applicable.	
Melting point/Melting range:	Not determined	
		(Contd. on page 3, USA -

Product name: Thulium(III) sulfate octahydrate

Const. or page 1 Const. or p	Product name: Thulium(III) sulfate o	ctahydrate		
Sublimation temperature / start: Mol applicable Print Dolling Mol applicable Auto granting: Mol applicable Auto granting: Mol applicable Auto granting: Product does not present an explosion hazard. Despect explosion: Product does not present an explosion hazard. Despect explosion: Product does not present an explosion hazard. Despect of explosion: Not determined Vector of explosion: Not dependence Vector of explosion: Not dependence Other information Not dependence Vector of explosion: Not dependence <th></th> <th>(Contd. of page 2)</th>		(Contd. of page 2)		
Flesh point: Not applicable Wide determined Action glinitistic Wide determined Wide de	Boiling point/Boiling range: Sublimation temperature / start:			
Applicing support Not determined Applic procession: Product does not present an oxplosion hazard. Durger of explosion: Product does not present an oxplosion hazard. Durger is main: Not determined Durger is main: Not applicable. Durger is main: Not applicable. Durger is main: Not applicable. Charrier is able in the information available. Not applicable. Durger is main: Not applicable.	Flash point:	Not applicable		
Auto gruting: Med determined. Darger of replosion: Product does not present an explosion hazard. Description: Not determined. Upper: Not determined. Description: Not determined. Water Not determined. Water Normation Not determined. Water Normation Not determined. Water Normation Not determined. Water Normation Not d	Flammability (solid, gaseous) Ignition temperature:			
Design of explosion: Product addees not present an explosion hazard. Explosion: Not determined upper: Not determined with addees not present and explosion hazard. Upper: Not determined upper: Not determined with addees not present addees not present addees not present not addees not present addees not present addees not present not addees not present addees not present addees not present addees not present addees not present not addees not present addees not present addees not present addees not present addees not present not addees not present adde	Decomposition temperature: Auto igniting:			
Explosion Initis: Not determined Upper: Not determined topper: Planting descriptions: Not determined topper: Not determined topper: Not determined topper: Planting descriptions: Not determined topper: Not determined topper: Not determined topper: Planting descriptions: Not determined topper: Not determined topper: Not determined topper: Vacashy: Not determined topper: Not determined topper: Not determined topper: Vacashy: Not determined topper: Not applicable topper: Not determined topper: Other information Not determined topper: Not determined topper: Not determined topper: Information: Not determined topper: Not determined topper: Not determined topper: Information: Not determined topper: Not determined topper: Not determined topper: Conditions to avoid Not Uniter relevant information available: Not determined topper: Not determined topper: Conditions to avoid Not Uniter relevant information available: Not determined topper: Not determined topper: Conditions to avoid Not Uniter relevant information available: Not determined topper: Not determined topper: <	Danger of explosion:			
Upper Upper Decomposition Mode Intermined Weight and Relative density Mode Intermined Weight and Particles Control (1998) Partice Control (1998) Mode Intermined Weight and Control (1998) Mode Intermined Weight and Control (1998) 10 Stability and reactivity Weight and Control (1998) Mode Intermined Weight and Control (1998) 20 Stability and reactivity Weight and Control (1998) Mode Intermined Weight and Control (1998) 20 Stability and reactivity Weight and Control (1998) Mode Intermined Weight and Control (1998) 20 Stability and reactivity Weight and Control (1998) Mode Intermined Weight and Control (1998) 20 Stability and reactivity Weight and Control (1998) Mode Intermined Weight and Control (1998) 20 Stability and reactivity Weight and Control (1998) Mode Intermined Weight and Control (1998) 20 Stability and reactivity Weight and Control (1998) Mode Intermined Weight and Control (1998) 20 Stability and reactivity Weight and Control (1998) Mode Intermined Weight and Control (1998) 21 Toxicological Information Information on toxicological diffects Information on toxicological diffects Information Information on toxicological diffects Information on toxicological diffects Information on toxicological diffects Information on toxicological diffects Information on toxicological diffects Inf	Explosion limits:			
Density: Approximative market in the second standard	Upper:	Not determined		
Water damaging Mod applicable. Notice damaging Mod applicable. Notice damaging Mod applicable. Notice damaging Mod applicable. National Science Mod applicable. National Science Mod applicable. National Science Mod applicable. National Science Mod applicable. Other Information Mod Information available. 10 Stability and reactivity Mod applicable. Content Information Mod Information available. 11 Toxicological Information Mod applicable. New Contrastructure Science Scienc	Density:	Not determined		
Eventoriality rate Not applicable. Water Not applicable. Water Not applicable. Water Not applicable. Water Not applicable. Differ Information Not applicable. Differ Information No full-builty and reactivity Reactivity Not information known Reactivity Not full-base to avoid the opposition view information available. Differ Information No full-base to avoid Not full-base to avoid the Cocomposition view information available. Incompation on toxicological effects Not applicable. Water model Not applicable. More applicable. Not avoid Not full-base to avoid Not full-base to avoid Not full-base shift information available. Information on toxicological effects Not applicable. More applicable. Not applicable. Dublic COV states that are relevant for classification: No data Not applicable. Shift information on toxicological effects Non applicable. Dublic COV states that are relevant for classification: No applicable. Shift information on corresport. Not applicable. Shift information on corresport. Not applicable. <t< th=""><th>Relative density Vapor density</th><th></th></t<>	Relative density Vapor density			
Weter: Out of applicable. With the second sec		Not applicable.		
Viscosity:	Water:			
Mineration Not applicable. 10 Stability and reactivity Not applicable. 10 Stability and reactivity Reactivity No information know. Reactivity No information know. Reactivity No information know. Therminit decomposition / conditions to be avoided. Decomposition in outpace avoided. Decomposition in collections known Reactivity No information avoidable. Incompatible materials: Distribution of the stability of heard does not information avoidable. Incompatible and collegies of an observations in the avoid on avoidable. Reactivity No information information avoidable. Information on toxicological information Information on toxicological effects Auto a stability of heard does in the observation information No data Distribution of compatible information information No data Diversity No effects known. Sensitiation of consological effects known. Construction of the stability of black does in the stability of th	Viscosity:			
10 Stability and reactivity Rescription information known. Chemical stability Stabile under recommended storage conditions. Thermal decomposition / conditions to be avoided: Decomposition will not occur if used and stored according to specifications. Chemical stability Stabile under recommended storage conditions. Chemical stability Stabile under recommended storage conditions. Chemical stability Stabile under relevant information evaluable. Conducting agents Hazardous decomposition products: Sultur oxides (SOV) Medit code luma 11 Toxicological information Information on toxicological effects Acute toxicity: No effects known. Eye Initiation or corrosion: Classes serial core withalian. Sensitization: No sensitizing effects known. Gern call indegradity: No effects known. Specific cargor cores toxicity - repeated exposure: No effects known. Specific cargor cores toxicity - repeated exposure: No effects known. Subuct to toxicity: No effects known. Subact to toxiconoic (NC): <t< th=""><th>kinematic:</th><th></th></t<>	kinematic:			
Rescuiring No information income. Chemical stability Stabile under recommended storage conditions. Thermical decomposition / conditions to be avoided: Decomposition will not occur if used and stored according to specifications. Chemical stability Stabile under relevant information available. Conditions to sould No Intervencemented storage conditions. The compatible materials: Chemical stability Stabile under relevant information available. 11 Toxicological information Information on toxicological effects Acute toxicity: No effects from the cases floation: No data Conditions is stability stabile under stability information. Eye Intellow or corrosion: Classes stroke set winding Constructions in the EPA, IARC, NTP, OSHA or ACGH. Reperive organ system or elevant is classes and stroke set winding Constructions in the set stroke set winding Eye Intellow or corrosion: No setsitizing elects known. Constructions in the end store of the stroke or elevant is classes and store setsitization: No setsitization ster on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGH. Reproductive foxicity: No effects known. Subact to chronic toxicity - repeated exposure: No effects known. Subact to chronic toxicity: No effects known. Subact to chronic toxicity: No effects known. Subact to chronic toxicity: No effects known. Subact to chronic toxicity: No effects known. Additional toxicolo	Other information	No further relevant information available.		
Rescuive / No information / nown. Chemical stability Stabile under recommended storage conditions. Thermical decomposition / conditions to be avoided. Decomposition will not occur if used and stored according to specifications. Specifications. Conditions to sould No Intervencemented storage conditions. The conditions of the relevant information available. Incompatible materials: Watering optimal decomposition products: Suffic codes (SOA! Material optimal (SOA! Material optimal decomposition products: Suffic codes (SOA! Information on toxicological effects Acute toxicity: No effects Norm for classes finate set on the class stability in the classes finate set on the classes stability on the classes and the classes to the classes stability on the toxicity on the classes stability on the toxicity of the classes to the classes stability on the classes and the classes to the classe	10 Stability and reactivity			
Possibility of nazarobus feed roots who dangerous reactions known Incompatibility of nazarobus reactions information available. Introduction on toxicological information Information or corresion: Causes setsin inflation. Been inflation or corresion: Causes setsin inflation. Carcinogenicity: No diselectation atta on corriopenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGH. Carcinogenicity: No diselectation of the on corresion: Causes exposure: Ney clease respiratory initiation. Specific target organ system toxicity: - repeated exposure: Ney clease respiratory initiation. Specific target organ system toxicity: - repeated exposure: Ney clease lead to sensitivity to heat, liching, increased awareness of odor and taste. and here damage. Exposure may also lead to sensitivity to heat, liching, increased awareness of odor and taste. and there damage. E	Reactivity No information known.			
Possibility of nazarobus feed roots who dangerous reactions known Incompatibility of nazarobus reactions information available. Introduction on toxicological information Information or corresion: Causes setsin inflation. Been inflation or corresion: Causes setsin inflation. Carcinogenicity: No diselectation atta on corriopenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGH. Carcinogenicity: No diselectation of the on corresion: Causes exposure: Ney clease respiratory initiation. Specific target organ system toxicity: - repeated exposure: Ney clease respiratory initiation. Specific target organ system toxicity: - repeated exposure: Ney clease lead to sensitivity to heat, liching, increased awareness of odor and taste. and here damage. Exposure may also lead to sensitivity to heat, liching, increased awareness of odor and taste. and there damage. E	Chemical stability Stable under recom	mended storage conditions. to be avoided: Decomposition will not occur if used and stored according to specifications		
Incompatible materials: Dividing sparks Dividing sparks Heartowick (Sox) Material code (Sox) Metal code (Sox) Material code (Sox) Metal code (Sox) Minor code (Sox) Metal code (Sox) Material code (Sox) Metal code (Sox) Material code (Sox) Metal code (Sox) Skin Intration or corrosion: Causes skin mitation. Eye inflation or corrosion: Causes skin mitation. Eye inflation or corrosion: Causes skin mitation. Eye inflation or corrosion: Causes skin mitation. Carronogenicity: No classification data on carrinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH. Reproductive food(S): No classification data on carrinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH. Reproductive food(S): No classification data on carrinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH. Reproductive food(S): No classification data on carrinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH. Reproductive food(S): No classification data on carrinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH. Reproductive food(S): No classification data on carrinogenic properties of this material is available. Apactive choronic toxicity: No effects known. <	Possibility of nazardous reactions No	o dangerous reactions known		
Hazardous decomposition products: Sulfar oxides (SCX) Mean axide tume 11 Toxicological information Information on toxicological effects Acute toxicity: No effects from: LOLC50 values that are relevant for classification: No data Skin infration or corrosion: Causes serious eye inflation. Eye inflation or corrosion: Causes serious eye inflation: Carcinogenicity: No effects from: Carcinogenicity: No effects from: Serior classification or corrosion: Causes serious eye inflation. Serior classification or corrosion: Causes serious eye inflation: Germ cell mutagenicity: No effects from: Specific target organ system toxicity - ropeted exposure: No effects known. Specific target organ system toxicity - ropeted exposure: Moy cause respiratory inflation. Aspiration braced: No effects known Subcourts to chronic toxicity - ropeted exposure: Moy cause respiratory inflation. Aspiration braced: No effects known Aspiration for toxicity: No further relevant information available. Additional toxiclogical information: To the best of our knowledge the acute and chronic toxicity of this substance is not fully known. 12 Ecological Information Toxicity Aquatic toxicity: No further relevant information available. Bioaccumulative potential No further relevant information available. Additional ecological information: Do not allow material to be released to the environment without proper governmental permits. Do not allow material to be released to the environment without proper governmental permits. Do not allow material to be released to the environment without proper governmental permits. Do not allow material to be released to the environment without proper governmental permits. Do not allow material to be released to the environment without proper governmental permits. Do not allow material to be released to the environment without proper governmental permits. Do not allow material to braneportation: Wester transment methods Weste trans	Incompatible materials:			
Hazardous decomposition products: Sulfar oxides (SCX) Mean axide tume 11 Toxicological information Information on toxicological effects Acute toxicity: No effects from: LOLC50 values that are relevant for classification: No data Skin infration or corrosion: Causes serious eye inflation. Eye inflation or corrosion: Causes serious eye inflation: Carcinogenicity: No effects from: Carcinogenicity: No effects from: Serior classification or corrosion: Causes serious eye inflation. Serior classification or corrosion: Causes serious eye inflation: Germ cell mutagenicity: No effects from: Specific target organ system toxicity - ropeted exposure: No effects known. Specific target organ system toxicity - ropeted exposure: Moy cause respiratory inflation. Aspiration braced: No effects known Subcourts to chronic toxicity - ropeted exposure: Moy cause respiratory inflation. Aspiration braced: No effects known Aspiration for toxicity: No further relevant information available. Additional toxiclogical information: To the best of our knowledge the acute and chronic toxicity of this substance is not fully known. 12 Ecological Information Toxicity Aquatic toxicity: No further relevant information available. Bioaccumulative potential No further relevant information available. Additional ecological information: Do not allow material to be released to the environment without proper governmental permits. Do not allow material to be released to the environment without proper governmental permits. Do not allow material to be released to the environment without proper governmental permits. Do not allow material to be released to the environment without proper governmental permits. Do not allow material to be released to the environment without proper governmental permits. Do not allow material to be released to the environment without proper governmental permits. Do not allow material to braneportation: Wester transment methods Weste trans	Oxidizing agents Water/moisture			
Metal oxide fume 11 Toxicological information Information on toxicological effects Acute toxicity: No effects known, Eve initiation or corrosion: Causes serious eve initiation. Sensitization fuzzare to exite series involve. Sensitization fuzzare to effects known. Specific target organ system toxicity - repeated exposure: No effects known. Specific target organ system toxicity - repeated exposure: No effects known. Specific target organ system toxicity - repeated exposure: No effects known. Specific target organ system toxicity - repeated exposure: No effects known. Specific target organ system toxicity - replet exposure: No effects known. Subactite to chronic toxicity on the set of our knowledge the acute and chronic toxicity of this substance is not fully known. Teclogical information: To the best of our knowledge the acute and chronic toxicity of this substance is not fully known. Teclogical information willable. Arguite toxicity: No further relevant information available. Resistence and degradability No further relevant information available. Reserver effects No further relevant information available. Mobility in soil No further relevant infor	Hazardous decomposition products:			
Information on toxicological effects Acute toxicity: No effects known. LDLC50 values that are relevant for classification: No data Skin initiation or corrosion: Clauses skin initiation. Eye Initiation or corrosion: Clauses skin initiation. Sensitization of corrosion: Clauses skin initiation. Sensitization of corrosion: Clauses skin initiation. Sensitization of corrosion: Clauses skin initiation. Specific target organ system toxicity - repeated exposure: Mo effects known. Specific target organ system toxicity - single exposure: May cause respiratory initiation. Aspiration flazard: No effects known. Subacute to chronic toxicity: No effects known. Additional toxicological information: 2 Ecological information Toxicity Aquatic toxicity: No further relevant information available. Bescurulative potential No turber relevant information available. Bescurulative potential No turber relevant information available. Additional ecological information Con allow undified product or large quantilies to reach ground water, water course or sewage system. Additional ecological	Metal oxide fume			
Acute toxicity: No effects known. LDLCSO vertices that are relevant for classification: No data Skin Irritation or corroston: Causes skin Irritation. Sensitization: No sensitization or corroston: Causes skin Irritation. Sensitization: No sensitization of a corrostone causes skin Irritation. Sensitization: No sensitization data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH. Reproductive toxicity: No effects known. Specific target organ system toxicity - repeated exposure: No effects known. Aspiration hazard: No effects known. Subacute to chronic toxicity: Lanthanons can cause delayed blood cloting leading to hemorrhages. Exposure may also lead to sensitivity to heat, itching, increased awareness of odor and taste, and liver dimage. Subacute to chronic toxicity: Lanthanons can cause delayed blood cloting leading to hemorrhages. Exposure may also lead to sensitivity to heat, itching, increased awareness of odor and taste, and liver dimage. Subacute to chronic toxicity: Lanthanons can cause delayed blood cloting leading to hemorrhages. Exposure may also lead to sensitivity to heat, itching, increased awareness of odor and taste, and liver dimage. Subacute to chronic toxicity: No effects known. 32 24 24 24 24 24 24 24 24 24 2	11 Toxicological information			
LDLC50 values that are relevant for classification: No data Skin initiation or corroston: Causes serious eye irritation. Eye irritation or corroston: Causes serious eye irritation. Eye irritation or corroston: Causes serious eye irritation. Germ cell mutagenicity: No effects known. Specific target organ system toxicity - repeated exposure: No effects known. Specific target organ system toxicity - single exposure: No effects known. Specific target organ system toxicity - single exposure: No effects known. Specific target organ system toxicity - single exposure: No effects known. Subacute to chronic toxicity: No effects known. Subacute to chronic toxicity: No effects known. Additional toxicological information: To the best of our knowledge the acute and chronic toxicity of this substance is not fully known. 12 Ecological information Toxicity Additional toxicological information available. Heristance and degradability No further relevant information available. Persistence and degradability No further relevant information available. Mobility in soll	Information on toxicological effects			
Skin Irritation or corrosion: Causes skin Irritation. Eye Irritation or corrosion: Causes skin Irritation. Sensitization: No sensitizing effects known. Germ cell mutagenicity: No effects known. Germ cell mutagenicity: No effects known. Specific target organ system toxicity - repeated exposure: No effects known. Specific target organ system toxicity - repeated exposure: May cause respiratory irritation. Aspiration brazard: No effects known. Subcure to chronic toxicity: Lantificancy scan cause delayed blood clotting leading to hemorrhages. Exposure may also lead to sensitivity to heat, itching, increased awareness of odor and taste. Subcure to chronic toxicity: No effects known. Additional toxicological information: Toxicity Additional degradability No urther relevant information available. Persistence and degradability No further relevant information available. Mobility in soil No further relevant information available.	Acute toxicity: No effects known. LD/LC50 values that are relevant for o	classification: No data		
Reproductive toxicity. No effects known. Specific target organ system toxicity - speated exposure: May cause respiratory irritation. Subacute to target organ system toxicity - single exposure: May cause respiratory irritation. Subacute totaristic target organ system toxicity - single exposure: May cause respiratory irritation. Subacute totaristic. No effects known. and liver damage. Subacute to chronic toxicity: No effects known. Additional toxicological information Toxicity Additional toxicological information available. Additional toxicological information available. Additional ecological information available. Mobility in soil No further relevant information available. Mobility of Part and VPUB assessment PBT. Not applicable. Other adverse effects No further relevant information available. VPUE: Not applicable. Other adverse effects No further relevant information available. Move: PBT. Not applicable.	Skin irritation or corrosion: Causes sl	kin irritation		
Reproductive toxicity. No effects known. Specific target organ system toxicity - speated exposure: May cause respiratory irritation. Subacute to target organ system toxicity - single exposure: May cause respiratory irritation. Subacute totaristic target organ system toxicity - single exposure: May cause respiratory irritation. Subacute totaristic. No effects known. and liver damage. Subacute to chronic toxicity: No effects known. Additional toxicological information Toxicity Additional toxicological information available. Additional toxicological information available. Additional ecological information available. Mobility in soil No further relevant information available. Mobility of Part and VPUB assessment PBT. Not applicable. Other adverse effects No further relevant information available. VPUE: Not applicable. Other adverse effects No further relevant information available. Move: PBT. Not applicable.	Eye irritation or corrosion: Causes serious eye irritation. Sensitization: No sensitizing effects known.			
Reproductive toxicity. No effects known. Specific target organ system toxicity - speated exposure: May cause respiratory irritation. Subacute to target organ system toxicity - single exposure: May cause respiratory irritation. Subacute totaristic target organ system toxicity - single exposure: May cause respiratory irritation. Subacute totaristic. No effects known. and liver damage. Subacute to chronic toxicity: No effects known. Additional toxicological information Toxicity Additional toxicological information available. Additional toxicological information available. Additional ecological information available. Mobility in soil No further relevant information available. Mobility of Part and VPUB assessment PBT. Not applicable. Other adverse effects No further relevant information available. VPUE: Not applicable. Other adverse effects No further relevant information available. Move: PBT. Not applicable.	Germ cell mutagenicity: No effects known. Carcinogenicity: No classification data on carcinogenic properties of this material is available from the EPA. IARC. NTP. OSHA or ACGIH.			
Specific target organ system toxicity - single exposure: May cause respiratory irritation. Aspiration hazard: No effects known. Subacute to chronic toxicity: Lanthanons can cause delayed blood clotting leading to hemorrhages. Exposure may also lead to sensitivity to heat, itching, increased awareness of odor and taste, and liver damage. Additional toxicological information: To the best of our knowledge the acute and chronic toxicity of this substance is not fully known. 12 Ecological information Toxicity Aquetic toxicity: No further relevant information available. Persistence and degradability No further relevant information available. Hobitity mostl No further relevant information available. Additional toxicological information: Do not allow material to be released to the environment without proper governmental permits. Do not allow material to be released to the environment without proper governmental permits. Do not allow unditude product or large quantities to reach ground water, water course or sewage system. Avoid transfer into the environment. Results of PBT and vPVB assessment PBT: Not applicable. Other adverse effects No further relevant information available. 13 Disposal considerations Waste treatment methods Recommendation: Disposal must be made according to official regulations.	Reproductive toxicity: No effects known.			
Subacute to chronic toxicity: Lanthanons can cause delayed blood clotting leading to hemorrhages. Exposure may also lead to sensitivity to heat, itching, increased awareness of odor and taste, and liver damage. Subacute to chronic toxicity: No effects known. Additional toxicological information Toxicity Additional toxicological information available. Persistence and degradability No further relevant information available. Bioaccumulative potential No further relevant information available. Additional ecological information: General notes: Do not allow material to be released to the environment without proper governmental permits. Do not allow unditude product or large quantities to reach ground water, water course or sewage system. Avoid transfer into the environment. Results of PBT and PVB assessment PBT: Not applicable. VPVB: Not applicable. Other adverse effects No further relevant information available. Information: Bisposal considerations Waste treatment methods Recommendation: Consult state, local or national regulations to ensure proper disposal. Uncleaned packagings: Recommendation: Subsosal material for transportation. UN-Number DOT, IMDG, IATA None UN-Number DOT, IMDG, IATA None	Specific target organ system toxicity - repeated exposure: May cause respiratory irritation.			
and liver damage. Subacute to chronic toxicity: No effects known. Additional toxicological information To the best of our knowledge the acute and chronic toxicity of this substance is not fully known. 12 Ecological information Toxicity Aquatic toxicity: No further relevant information available. Aquatic toxicity: No further relevant information available. Aquatic toxicity: No further relevant information available. Meditional ecological information available. Modifiumal ecological information available. Modifiumal ecological information available. Modifiumal ecological information available. Modifiumal ecological information available. Modifiumal ecological information available. Modifiumal ecological information available. Modifiumal ecological information available. Modifiumal ecological information available. Do not allow matherial to be released to the environment without proper governmental permits. Do not allow undilued product or large quantities to reach ground water, water course or sewage system. Avoid transfer into the environment. Results of PBT and VPB assessment PBT: Not applicable. Vrb applicable. Other adverse effects No further relevant information available. Information informati	Subacute to chronic toxicity:			
Subacute to chronic toxicity: No effects known. Additional toxicological information: To the best of our knowledge the acute and chronic toxicity of this substance is not fully known. 12 Ecological information Toxicity Aquatic toxicity: No further relevant information available. Persistence and degradability No further relevant information available. Mobility in soil No further relevant information available. Additional ecological information General notes: Do not allow material to be released to the environment without proper governmental permits. Do not allow undiluted product or large quantities to reach ground water, water course or sewage system. Advoid transfer into the environment. Results of PFT and vPVB assessment PBT: Not applicable. Other adverse effects No further relevant information available. 13 Disposal considerations Waste treatment methods Recommendation: Disposal must be made according to official regulations. 14 Transport information Note </th <th>and liver damage.</th> <th></th>	and liver damage.			
12 Ecological information Toxicity Aquatic toxicity: No further relevant information available. Persistence and degradability No further relevant information available. Bioaccumulative potential No further relevant information available. Mobility in soil No further relevant information available. Mobility in soil No further relevant information available. Additional ecological information: General notes: Do not allow undiluted product or large quantities to reach ground water, water course or sewage system. Avoid transfer into the environment. Results of PBT and VPVB assessment PBT: Not applicable. VP3: Not applicable. VP4: Not applicable. VP5: Not applicable. </th <th>Subacute to chronic toxicity: No effect</th> <th>ts known. To the best of our knowledge the acute and chronic toxicity of this substance is not fully known</th>	Subacute to chronic toxicity: No effect	ts known. To the best of our knowledge the acute and chronic toxicity of this substance is not fully known		
Toxicity Aquatic toxicity: No further relevant information available. Persistence and degradability No further relevant information available. Bioaccumulative potential No further relevant information available. Mobility in soil No further relevant information available. Mobility in soil No further relevant information available. Additional ecological information: General notes: Do not allow undiluted product or large quantities to reach ground water, water course or sewage system. Avoid transfer into the environment. Results of PBT and VPVB assessment PBT: Not applicable. Very is Not applicable. VPVB: Not applicable. Very assessment PBT: Not applicable. Very B: Not applicable. Not applicable. Not applicable. Very B:	• •			
Aquatic toxicity: No further relevant information available. Persistence and degradability No further relevant information available. Bioaccumulative potential No further relevant information available. Additional ecological information: General notes: Do not allow material to be released to the environment without proper governmental permits. Do not allow undiluted product or large quantities to reach ground water, water course or sewage system. Avoid transfer into the environment. Results of PBT and vPVB assessment PBT: Not applicable. VPVB: Not applicable. VPVB: Not applicable. VPVB: Not applicable. I3 Disposal considerations Waste treatment methods Recommendation: Disposal must be made according to official regulations. I4 Transport information UN-Number DOT, IMDG, IATA Note None Note Alta None None	-			
Bioaccumulative potential No further relevant information available. Mobility in soil No further relevant information available. Additional ecological information: General notes: Do not allow material to be released to the environment without proper governmental permits. Do not allow undiluted product or large quantities to reach ground water, water course or sewage system. Avoid transfer into the environment. Results of PBT and vPvB assessment PBT: Not applicable. vPvB: Not applicable. vPvB: Not applicable. VPvB: Not applicable. VPvB: Not applicable. Uncleaned packagings: Recommendation Consult state, local or national regulations to ensure proper disposal. Uncleaned packagings: Recommendation: Disposal must be made according to official regulations. 14 Transport information Not a hazardous material for transportation. UN-Number DOT, IMDG, LATA None None None	Aquatic toxicity: No further relevant int	iormation available.		
Mobility in soil No further relevant information available. Additional ecological information: General notes: Do not allow material to be released to the environment without proper governmental permits. Do not allow undiluted product or large quantities to reach ground water, water course or sewage system. Avoid transfer into the environment. Results of PBT and vPVB assessment PBT: Not applicable. vPvB: Not applicable. Other adverse effects No further relevant information available. 13 Disposal considerations Waste treatment methods Recommendation Consult state, local or national regulations to ensure proper disposal. Uncleaned packagings: Recommendation: Disposal must be made according to official regulations. 14 Transport information. Not a hazardous material for transportation. UN-Number DOT, IMDG, IATA None	Persistence and degradability No furth Bioaccumulative potential No further	her relevant information available. relevant information available.		
General notes: • • Do not allow material to be released to the environment without proper governmental permits. Do not allow undiluted product or large quantities to reach ground water, water course or sewage system. Avoid transfer into the environment. Results of PBT and vPVB assessment PBT: Not applicable. • vPvB: Not applicable. • Other adverse effects No further relevant information available. • 13 Disposal considerations Waste treatment methods Recommendation Consult state, local or national regulations to ensure proper disposal. • Uncleaned packagings: Recommendation: Disposal must be made according to official regulations. 14 Transport information None UN-Number None DOT, IMDG, IATA None	Mobility in soil No further relevant infor	mation available.		
Do not allow undiluted product or large quantities to reach ground water, water course or sewage system. Avoid transfer into the environment. Results of PBT and vPvB assessment PBT: Not applicable. vPvB: Not applicable. Other adverse effects No further relevant information available. 13 Disposal considerations Waste treatment methods Recommendation Consult state, local or national regulations to ensure proper disposal. Uncleaned packagings: Recommendation: Disposal must be made according to official regulations. 14 Transport information Not a hazardous material for transportation. UN-Number DOT, IMDG, IATA None None None	General notes:			
Results of PBT and vPvB assessment PBT: Not applicable. vPvB: Not applicable. Other adverse effects No further relevant information available. 13 Disposal considerations Waste treatment methods Recommendation Consult state, local or national regulations to ensure proper disposal. Uncleaned packagings: Recommendation: Disposal must be made according to official regulations. 14 Transport information Not a hazardous material for transportation. UN-Number DOT, IMDG, IATA None UN proper shipping name DOT, IMDG, IATA	Do not allow undiluted product or large of	quantities to reach ground water, water course or sewage system.		
PBT: Not applicable. VPVB: Not applicable. Other adverse effects No further relevant information available. 13 Disposal considerations Waste treatment methods Recommendation Consult state, local or national regulations to ensure proper disposal. Uncleaned packagings: Recommendation: Disposal must be made according to official regulations. 14 Transport information Not a hazardous material for transportation. UN-Number DOT, IMDG, IATA None UN proper shipping name DOT, IMDG, IATA	Avoid transfer into the environment. Results of PBT and vPvB assessmen	t		
Other adverse effects No further relevant information available. 13 Disposal considerations Waste treatment methods Recommendation Consult state, local or national regulations to ensure proper disposal. Uncleaned packagings: Recommendation: Disposal must be made according to official regulations. 14 Transport information Not a hazardous material for transportation. UN-Number DOT, IMDG, IATA None UN proper shipping name DOT, IMDG, IATA	PRT: Not applicable			
Waste treatment methods Recommendation Consult state, local or national regulations to ensure proper disposal. Uncleaned packagings: Recommendation: Disposal must be made according to official regulations. 14 Transport information Not a hazardous material for transportation. UN-Number DOT, IMDG, IATA None UN proper shipping name DOT, IMDG, IATA None	Other adverse effects No further releva	ant information available.		
Waste treatment methods Recommendation Consult state, local or national regulations to ensure proper disposal. Uncleaned packagings: Recommendation: Disposal must be made according to official regulations. 14 Transport information Not a hazardous material for transportation. UN-Number DOT, IMDG, IATA None UN proper shipping name DOT, IMDG, IATA None	13 Disposal considerations			
Uncleaned packagings: Recommendation: Disposal must be made according to official regulations. 14 Transport information Not a hazardous material for transportation. UN-Number DOT, IMDG, IATA None UN proper shipping name DOT, IMDG, IATA None	Waste treatment methods			
Recommendation: Disposal must be made according to official regulations. 14 Transport information Not a hazardous material for transportation. UN-Number DOT, IMDG, IATA None UN proper shipping name DOT, IMDG, IATA None		or national regulations to ensure proper disposal.		
Not a hazardous material for transportation. UN-Number DOT, IMDG, IATA UN proper shipping name DOT, IMDG, IATA None	Recommendation: Disposal must be m	ade according to official regulations.		
UN-Number DOT, IMDG, IATA None UN proper shipping name DOT, IMDG, IATA None		ion		
UN proper shipping name DOT, IMDG, IATA None	UN-Number			
		NONE		
(Cond. on page 4)	DOT, IMDG, IATA			
		[Contal on page 4] USA —		

	Reviewed on 03/10/2003
Product name: Thulium(III) sulfate octahydrate	
•	(Contd. of page 3
Transport hazard class(es)	Conta. of page 3
DOT, ADR, IMDG, IATA Class	None
Packing group DOT, IMDG, IATA	None
Environmental hazards:	Not applicable.
Special precautions for user	Not applicable.
Transport in bulk according to Annex II of MARPOL73/78 and	I the IBC Code Not applicable.
Transport/Additional information:	Not dangerous according to the above specifications.
DOT Marine Pollutant (DOT):	No
P304+P340 IF INHALED: Remove person to fresh air and I P405 Store locked up. P501 Dispose of contents/container in accordance w National regulations All components of this product are listed in the U.S. Environmenta All components of this product are listed on the Canadian Non-Do SARA Section 313 (specific toxic chemical listings) Substance California Proposition 65 Prop 65 - Chemicals known to cause cancer Substance is not I Prop 65 - Developmental toxicity, female Substance is not listed. Prop 65 - Developmental toxicity, male Substance is not listed. Prop 65 - Developmental toxicity, male Substance is not listed.	pray. protection/face protection. protection/face protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection. protection
information to ensure proper use and protect the health and safety	ther information gathered by them, and should make independent judgement of suitability of this y of employees. This information is furnished without warranty, and any use of the product not in ion with any other product or process, is the responsibility of the user.
Department issuing SDS: Global Marketing Department Date of preparation / last revision 11/24/2015 / - Abbreviations and acronyms: RID: Règlement international concernant le transport des marchandises dangereuses p IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO, INDG: International Maritime Code for Dangerous Goods DOT: US Department of Transport Association EINECS: European Inventory of Existing Commercial Chemical Substances CAS: Chemical Abstracts Service (division of the American Chemical Society) HMIS: Hazardous Materials Identification System (USA) WHMIS: Workplace Hazardous Materials Information System (Canada) LC50: Lethal concentration, 50 percent LD50: Lethal dose, 50 percent LD50: Lethal dose, 50 percent LC60: Accouptional Safety and Health Administration (USA) NTP: National Toxicology Program (USA) NTP: National Toxicology Program (USA) NTP: National Agency for Research on Cancer EPA: Environmental Agency for Research on Cancer EPA: Environmental Protection Agency (USA)	par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail) ion" (IATA))) USA