Oak Ridge National Laboratory Oak Ridge, Tennessee 37831

IBO-MSDS-04997

MATERIAL SAFETY DATA SHEET

The issuance of this document complies with the U. S. Department of Labor, Occupational Safety and Health Administration's (OSHA) Hazard Communication Standard 29 CFR 1910.1200. Standard must be consulted for specific requirements.

D ~						opeome require	
<u>Definitions</u> :	<u>ACGIH</u>		Conference of Gove	ernmental Indu	strial Hygienists		ASC
	<u>NIOSH</u>	National Ins	stitute for Occupat	ional Safety an	nd Health	-	1 - 1 AS C
	<u>NE</u>	Not Establis	shed	NISS	Not In Sources	Canal . 1	0000
	<u>NA</u>	Not Applica	ıble	TLV	Threshold Limit	Searched	& 2006
	TWA		ited Average	PEL			-/
			.voa itvenage	FEL	Permissible Exp	osure Limit	7
IDEN	TITY (As u	sed on label and	list): Ruthenii	ım (-96 -98 -9	99, -100, -101, 102	104) 14 + 15	3
		_				, -104) Metal Po	wder
Manufacturer's N	lame:	S	ECTION I. Man	ufacturer's Id			
	tartio.				Emergency Te	lephone Number	:
UT-Ba	ttelle				Lab S	hift Superintend	ent (865) 574-660 6
		tional Laborato			Telephone Nui	<u>nber for Assista</u> i	ice:
Isotone	Business (Menai Laburatu.	гу		Isotop	e Business Offic	e (865) 574-6984
	ox 2008	Jince					() 571 0704
		25024			Date Prepared:	06-March-19	087
Oak Ki	uge, 1 enne	essee 37831			Date Reviewed		
							,
Exposure Limits:		SECTION	II. Hazardous l	ngredients/Id	entity Information	n	
OSHA:				-			
ACGIH	Tri XI.			NE			
				NE			
NIOSH:				NE			
Immedia	itely Dange	rous to Life and	Health:	NE			
Chemical Formula		Ru			istry Number:	007440 40 0	
				RTECS N		007440-18-8	
Health Hazard Rat	ing:	l, slight health ha	azard			NISS	
Fire Hazard Rating		l, slightly flamm		DOT Clas		4.1, Flammable	e Solid
Reactivity Rating:		o, nonreactive	2010	DOT Labo		Flammable Sol	id
		,		DOT Nun	nber:	UN 3089	
DI : ID :		SECT	ION III. Physica	l/Chemical Cl	naracteristics		
Physical Description	<u>on</u> :		Silvery-white, har	d metal.			
Molecular Weight	<u>naturally o</u>	ccurring):	101.07				
Melting Point:			2450°C	Vapor Pre	SSIITe.	MICC	
Boiling Point:			4150°C	Vapor Der	eity:	NISS	
specific Gravity:			12.45 (water=1)	Percent Vo	alatilace	NISS	
Evaporation Rate:			NISS	Solubility:		NISS	
				goldonity.		Insoluble in wa	ter.
Shark David Control		SECT	TON IV. Fire and	d Explosion H	lazard Data		
lash Point (method	<u>1)</u> :	14199		Lower Flan	nmability Limit:	NISS	
utoignition Tempe	erature:	NISS		Unner Flan	nmahility Limit	NISS	
xtinguishing Medi		Extinguishing n	nedia suitable for s	urrounding me	storiola.		
irefighting Procedu		rifelighting tech	miques should cor	centrate on co	ntralling the	1 64 0	_
		materials. Wear	pressure-demand	self contains	d breathing apparat	d of the fire to o	ther combustible
		clothing.	pressure-demand,	sen-contained	i oreathing apparat	us and full firefi	ghting protective
re and Explosion I							
		in air producing	irritant effects on	ist when expos the eves and re	ed to heat or flame	. When heated,	it oxidizes readily
ability:			SECTION V.	Reactivity Dat	ta		
onditions to Avoid			Unstable:	Stab	le: X		
compatibility (aminin .		Heat when in dust				
compatibility (mate	erials to avo	<u>oid</u>): (Oxygen difluoride.				
zardous Decompo	sition or By	yproducts:	VISS				
zardous Polymeriz	zation:	N	May Occur:	Will	Not Occur	v	

Poutes of Entre	SECTION VI. Health H	lazard Data			
Routes of Entry:	Inhalation: NISS	Skin:	Ingestion:		
Signs and Symptoms of Exposure:			ingestion:		
Acute Inhalation:	NISS				
Acute Swallowing:	NISS				
Acute Skin Contact:	Irritant				
Acute Eye Contact:	Irritant				
Chronic:	NISS				
Health Hazards (Target organs/systems):					
Acute:	Eyes, skin (cutaneous haza	ard), respiratory system			
Chronic:	NISS	4), respiratory system.			
Emergency and First Aid Procedures:					
Inhalation:	Remove to fresh air. No e	mergency care antiginated			
Swallowing:	Remove to fresh air. No emergency care anticipated. Induce vomiting only after massive ingestion.				
Skin contact:	Remove contaminated clot	hing and wach alein with a	lenty of water for at least 15		
	minutes. Get medical aid.	and wash skill with p	lenty of water for at least 15		
Eye contact:	Flush eyes at once with wa	ter for at least 15			
Physicians' notes:	NISS	act for at least 15 minutes.	Get medical aid.		
Carcinogenicity: NTP No	IARC Monogr	aphs No	OSHA Regulated No		
Medical Conditions Generally Aggravated		•	OSHA Regulated No		
SECT	by Exposure: NISS				
SECT	by Exposure: NISS FION VII. Precautions for Saf				
SECT teps to be Taken in Case Material is Relea or wet sweeping in order to keep	by Exposure: NISS FION VII. Precautions for Safessed or Spilled: Notify safety persistence of the safety persistence of t	e Handling and Use	Remove spills by vacuuming		
SECT teps to be Taken in Case Material is Relea or wet sweeping in order to keep a	FION VII. Precautions for Safesed or Spilled: Notify safety pearborne dust at a minimum.	e Handling and Use	Remove spills by vacuuming		
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