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SAFETY DATA SHEET

SECTION 1. CHEMICAL IDENTIFICATION

CATALOG #: 47048

NAME: Bismuth nanopowder (100 nm)

SYNONYMS:

24 HOUR EMERGENCY
TELEPHONE: (800) 535-5053(USA)
352-323-3500 (INTERNATIONAL)

TO REQUEST AN MSDS: (800) 869-9290

CUSTOMER
SERVICE: (630) 766-2112

SECTION 2. HAZARDS IDENTIFICATION

CLASSIFICATION OF THE SUBSTANCE OR MIXTURE

GHS CLASSIFICATION IN ACCORDANCE WITH 29 CFR 1910 (OSHA HCS)
FLAMMABLE SOLIDS (CATEGORY 1), H228

FOR THE FULL TEXT OF THE H-STATEMENTS MENTIONED IN THIS SECTION, SEE SECTION 16.

**GHS LABEL ELEMENTS, INCLUDING PRECAUTIONARY STATEMENTS
PICTOGRAM**



SIGNAL WORD DANGER

HAZARD STATEMENT(S)
H228 FLAMMABLE SOLID.

PRECAUTIONARY STATEMENT(S)
P210 KEEP AWAY FROM HEAT/SPARKS/OPEN FLAMES/HOT SURFACES. -
NO SMOKING.
P240 GROUND/BOND CONTAINER AND RECEIVING EQUIPMENT.
P241 USE EXPLOSION-PROOF ELECTRICAL/ VENTILATING/ LIGHTING
EQUIPMENT.
P280 WEAR PROTECTIVE GLOVES/ EYE PROTECTION/ FACE
PROTECTION.
P370 + P378 IN CASE OF FIRE: USE DRY SAND, DRY CHEMICAL OR ALCOHOL-
RESISTANT FOAM FOR EXTINCTION.

**HAZARDS NOT
OTHERWISE
CLASSIFIED (HNOC)
OR NOT COVERED
BY GHS** NONE

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

MF: Bi
MW: 208.98
CAS-NO. 7440-69-9
PURITY: $\geq 99.5\%$ (Trace metals basis)

HAZARDOUS COMPONENTS

COMPONENT	CLASSIFICATION	CONCENTRATION
Bismuth nanopowder (100 nm)		

NO COMPONENTS NEED TO BE DISCLOSED ACCORDING TO THE APPLICABLE REGULATIONS.

FOR THE FULL TEXT OF THE H-STATEMENTS MENTIONED IN THIS SECTION, SEE SECTION 16.

SECTION 4. FIRST-AID MEASURES

DESCRIPTION OF FIRST AID MEASURES

GENERAL ADVICE	SHOW THIS MATERIAL SAFETY DATA SHEET TO THE DOCTOR IN ATTENDANCE.
IF INHALED	AFTER INHALATION: FRESH AIR.
IN CASE OF SKIN CONTACT	IN CASE OF SKIN CONTACT: TAKE OFF IMMEDIATELY ALL CONTAMINATED CLOTHING. RINSE SKIN WITH WATER/ SHOWER.
IN CASE OF EYE CONTACT	AFTER EYE CONTACT: RINSE OUT WITH PLENTY OF WATER. REMOVE CONTACT LENSES.
IF SWALLOWED	AFTER SWALLOWING: MAKE VICTIM DRINK WATER (TWO GLASSES AT MOST). CONSULT DOCTOR IF FEELING UNWELL.
MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH ACUTE AND DELAYED	THE MOST IMPORTANT KNOWN SYMPTOMS AND EFFECTS ARE DESCRIBED IN THE LABELLING (SEE SECTION 2.2) AND/OR IN SECTION 11.
INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED	NO DATA AVAILABLE

SECTION 5. FIRE AND EXPLOSION DATA

EXTINGUISHING MEDIA

SUITABLE EXTINGUISHING MEDIA	SUITABLE EXTINGUISHING MEDIA USE EXTINGUISHING MEASURES THAT ARE APPROPRIATE TO LOCAL CIRCUMSTANCES AND THE SURROUNDING ENVIRONMENT.
	UNSUITABLE EXTINGUISHING MEDIA FOR THIS SUBSTANCE/MIXTURE NO LIMITATIONS OF EXTINGUISHING AGENTS ARE GIVEN.
SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE	BISMUTH OXIDES NOT COMBUSTIBLE. AMBIENT FIRE MAY LIBERATE HAZARDOUS VAPOURS.

**ADVICE FOR
FIREFIGHTERS**

IN THE EVENT OF FIRE, WEAR SELF-CONTAINED
BREATHING APPARATUS.

FURTHER INFORMATION

PREVENT FIRE EXTINGUISHING WATER FROM
CONTAMINATING SURFACE WATER OR THE GROUND
WATER SYSTEM.

SECTION 6. ACCIDENTAL RELEASE MEASURES

**PERSONAL
PRECAUTIONS,
PROTECTIVE EQUIPMENT
AND EMERGENCY
PROCEDURES**

ADVICE FOR NON-EMERGENCY PERSONNEL: AVOID
INHALATION OF DUSTS. AVOID SUBSTANCE CONTACT.
ENSURE ADEQUATE VENTILATION. KEEP AWAY FROM
HEAT AND SOURCES OF IGNITION. EVACUATE THE
DANGER AREA, OBSERVE EMERGENCY PROCEDURES,
CONSULT AN EXPERT.
FOR PERSONAL PROTECTION SEE SECTION 8.

**ENVIRONMENTAL
PRECAUTIONS**

DO NOT LET PRODUCT ENTER DRAINS. RISK OF
EXPLOSION.

**METHODS AND
MATERIALS FOR
CONTAINMENT AND
CLEANING UP**

COVER DRAINS. COLLECT, BIND, AND PUMP OFF SPILLS.
OBSERVE POSSIBLE MATERIAL RESTRICTIONS
(SEE SECTIONS 7 AND 10). TAKE UP DRY. DISPOSE OF
PROPERLY. CLEAN UP AFFECTED AREA. AVOID
GENERATION OF DUSTS.

**REFERENCE TO OTHER
SECTIONS**

FOR DISPOSAL SEE SECTION 13.

SECTION 7. HANDLING AND STORAGE

**PRECAUTIONS FOR SAFE
HANDLING**

KEEP AWAY FROM OPEN FLAMES, HOT SURFACES AND
SOURCES OF IGNITION. TAKE PRECAUTIONARY
MEASURES AGAINST STATIC DISCHARGE.
CHANGE CONTAMINATED CLOTHING. WASH HANDS AFTER
WORKING WITH SUBSTANCE.
FOR PRECAUTIONS SEE SECTION 2.2.

**CONDITIONS FOR SAFE
STORAGE, INCLUDING
ANY INCOMPATIBILITIES**

TIGHTLY CLOSED. KEEP AWAY FROM HEAT AND SOURCES
OF IGNITION.

STORAGE CLASS (TRGS 510): 4.1B: FLAMMABLE SOLID
HAZARDOUS MATERIALS

Store at RT

SPECIFIC END USE(S)

APART FROM THE USES MENTIONED IN SECTION 1.2 NO OTHER SPECIFIC USES ARE STIPULATED.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

CONTROL PARAMETERS

COMPONENTS WITH WORKPLACE CONTROL PARAMETERS

CONTAINS NO SUBSTANCES WITH OCCUPATIONAL EXPOSURE LIMIT VALUES.

EXPOSURE CONTROLS

APPROPRIATE ENGINEERING CONTROLS CHANGE CONTAMINATED CLOTHING. WASH HANDS AFTER WORKING WITH SUBSTANCE.

PERSONAL PROTECTIVE EQUIPMENT

EYE/FACE PROTECTION USE EQUIPMENT FOR EYE PROTECTION TESTED AND APPROVED UNDER APPROPRIATE GOVERNMENT STANDARDS SUCH AS NIOSH (US) OR EN 166(EU). SAFETY GLASSES

SKIN PROTECTION HANDLE WITH GLOVES. GLOVES MUST BE INSPECTED PRIOR TO USE. USE PROPER GLOVE REMOVAL TECHNIQUE (WITHOUT TOUCHING GLOVE'S OUTER SURFACE) TO AVOID SKIN CONTACT WITH THIS PRODUCT. DISPOSE OF CONTAMINATED GLOVES AFTER USE IN ACCORDANCE WITH APPLICABLE LAWS AND GOOD LABORATORY PRACTICES. WASH AND DRY HANDS.

BODY PROTECTION FLAME RETARDANT ANTISTATIC PROTECTIVE CLOTHING.

RESPIRATORY PROTECTION REQUIRED WHEN DUSTS ARE GENERATED. OUR RECOMMENDATIONS ON FILTERING RESPIRATORY PROTECTION ARE BASED ON THE FOLLOWING STANDARDS: DIN EN 143, DIN 14387 AND OTHER ACCOMPANYING STANDARDS RELATING TO THE USED RESPIRATORY PROTECTION SYSTEM.

CONTROL OF ENVIRONMENTAL EXPOSURE DO NOT LET PRODUCT ENTER DRAINS. RISK OF EXPLOSION.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	Black powder
ODOUR	NO DATA AVAILABLE
ODOUR THRESHOLD	NO DATA AVAILABLE
PH	NO DATA AVAILABLE
MELTING POINT/FREEZING POINT	271 °C (Lit.)
INITIAL BOILING POINT AND BOILING RANGE	1420 - 1560 °C (Lit.)
FLASH POINT	
EVAPOURATION RATE	NO DATA AVAILABLE
FLAMMABILITY (SOLID, GAS)	THE SUBSTANCE OR MIXTURE IS A FLAMMABLE SOLID WITH THE CATEGORY 1.
UPPER/LOWER FLAMMABILITY OR EXPLOSIVE LIMITS	NO DATA AVAILABLE
VAPOUR PRESSURE	NO DATA AVAILABLE
VAPOUR DENSITY	NO DATA AVAILABLE
RELATIVE DENSITY	
WATER SOLUBILITY	NO DATA AVAILABLE
PARTITION COEFFICIENT: N- OCTANOL/WATER	NOT APPLICABLE FOR INORGANIC SUBSTANCES
AUTO-IGNITION TEMPERATURE	NO DATA AVAILABLE
DECOMPOSITION TEMPERATURE	NO DATA AVAILABLE
VISCOSITY	NO DATA AVAILABLE
EXPLOSIVE PROPERTIES	NO DATA AVAILABLE
OXIDIZING PROPERTIES	NO DATA AVAILABLE

OTHER SAFETY INFORMATION

NO DATA AVAILABLE

SECTION 10. STABILITY AND REACTIVITY

REACTIVITY	NO DATA AVAILABLE
CHEMICAL STABILITY	THE PRODUCT IS CHEMICALLY STABLE UNDER STANDARD AMBIENT CONDITIONS.
POSSIBILITY OF HAZARDOUS REACTIONS	NO DATA AVAILABLE
CONDITIONS TO AVOID	NO DATA AVAILABLE
INCOMPATIBLE MATERIALS	STRONG OXIDIZING AGENTS

**HAZARDOUS
DECOMPOSITION
PRODUCTS**

IN THE EVENT OF FIRE: SEE SECTION 5

SECTION 11. TOXICOLOGICAL INFORMATION

INFORMATION ON TOXICOLOGICAL EFFECTS

ACUTE TOXICITY	LD50 ORAL - RAT - 5,000 MG/KG REMARKS: (RTECS)
	INHALATION: NO DATA AVAILABLE
	DERMAL: NO DATA AVAILABLE
	NO DATA AVAILABLE
SKIN CORROSION/IRRITATION	NO DATA AVAILABLE
SERIOUS EYE DAMAGE/EYE IRRITATION	NO DATA AVAILABLE
RESPIRATORY OR SKIN SENSITISATION	NO DATA AVAILABLE
GERM CELL MUTAGENICITY	NO DATA AVAILABLE
CARCINOGENICITY	
IARC:	NO COMPONENT OF THIS PRODUCT PRESENT AT LEVELS GREATER THAN OR EQUAL TO 0.1% IS IDENTIFIED AS PROBABLE, POSSIBLE OR CONFIRMED HUMAN CARCINOGEN BY IARC.
NTP:	NO COMPONENT OF THIS PRODUCT PRESENT AT LEVELS GREATER THAN OR EQUAL TO 0.1% IS IDENTIFIED AS A KNOWN OR ANTICIPATED CARCINOGEN BY NTP.
OSHA:	NO COMPONENT OF THIS PRODUCT PRESENT AT LEVELS GREATER THAN OR EQUAL TO 0.1% IS ON OSHA S LIST OF REGULATED CARCINOGENS.
REPRODUCTIVE TOXICITY	NO DATA AVAILABLE
SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE	NO DATA AVAILABLE
SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE	NO DATA AVAILABLE

ASPIRATION HAZARD

NO DATA AVAILABLE

**ADDITIONAL
INFORMATION**

RTECS: EB2600000

TO THE BEST OF OUR KNOWLEDGE, THE CHEMICAL,
PHYSICAL, AND TOXICOLOGICAL PROPERTIES HAVE NOT
BEEN THOROUGHLY INVESTIGATED.

SECTION 12. ECOLOGICAL INFORMATION

TOXICITY

NO DATA AVAILABLE

**PERSISTENCE AND
DEGRADABILITY**

NO DATA AVAILABLE

**BIOACCUMULATIVE
POTENTIAL**

NO DATA AVAILABLE

MOBILITY IN SOIL

NO DATA AVAILABLE

**RESULTS OF PBT AND
VPVB ASSESSMENT**

PBT/VPVB ASSESSMENT NOT AVAILABLE AS CHEMICAL
SAFETY ASSESSMENT NOT REQUIRED/NOT CONDUCTED.

**OTHER ADVERSE
EFFECTS**

NO DATA AVAILABLE

SECTION 13. DISPOSAL CONSIDERATIONS

WASTE TREATMENT METHODS**PRODUCT**

WASTE MATERIAL MUST BE DISPOSED OF IN
ACCORDANCE WITH THE NATIONAL AND LOCAL
REGULATIONS. LEAVE CHEMICALS IN ORIGINAL
CONTAINERS. NO MIXING WITH OTHER WASTE. HANDLE
UNCLEANED CONTAINERS LIKE THE PRODUCT ITSELF.

**CONTAMINATED
PACKAGING**

DISPOSE OF AS UNUSED PRODUCT.

SECTION 14. TRANSPORT INFORMATION

DOT (US)

PROPER SHIPPING NAME: METAL POWDERS, FLAMMABLE, N.O.S. (Bismuth nanopowder (100 nm))
UN NUMBER: 3089
CLASS: 4.1
PACKING GROUP: II
REPORTABLE QUANTITY (RQ):
POISON INHALATION HAZARD: NO

IMDG

PROPER SHIPPING NAME: METAL POWDERS, FLAMMABLE, N.O.S. (Bismuth nanopowder (100 nm))
UN NUMBER: 3089
CLASS: 4.1
PACKING GROUP: II
EMS-NO: F-G, S-G

IATA

PROPER SHIPPING NAME: METAL POWDERS, FLAMMABLE, N.O.S. (Bismuth nanopowder (100 nm))
UN NUMBER: 3089
CLASS: 4.1
PACKING GROUP: II

SECTION 15. REGULATORY INFORMATION

SARA 302 COMPONENTS THIS MATERIAL DOES NOT CONTAIN ANY COMPONENTS WITH A SECTION 302 EHS TPQ.

SARA 313 COMPONENTS THIS MATERIAL DOES NOT CONTAIN ANY CHEMICAL COMPONENTS WITH KNOWN CAS NUMBERS THAT EXCEED THE THRESHOLD (DE MINIMIS) REPORTING LEVELS ESTABLISHED BY SARA TITLE III, SECTION 313.

SARA 311/312 HAZARDS FIRE HAZARD

MASSACHUSETTS RIGHT TO KNOW COMPONENTS

NO COMPONENTS ARE SUBJECT TO THE MASSACHUSETTS RIGHT TO KNOW ACT.

SECTION 16. OTHER INFORMATION

FULL TEXT OF H-STATEMENTS REFERRED TO UNDER SECTIONS 2 AND 3.
H228 FLAMMABLE SOLID.

MSDS LEGEND

MW: MOLECULAR WEIGHT
MF: MOLECULAR FORMULA
VOC: VOLATILE ORGANIC COMPOUNDS
ACGIH: AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL
HYGINISTS
CAS: CHEMICAL ABSTRACTS SERIVE REGISTRY NUMBER
OSHA: OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
PEL: PERMISSIBLE EXPOSURE LIMIT (OSHA)
TLV: THRESHOLD LIMIT VALUE (ACGIH)

IMPORTANT:

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