

## MATERIAL SAFETY DATA SHEET

### SECTION 1 — CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Identifier <b>Lead Magnesium Niobate – Lead Titanate (PMN-PT)</b>			
Product Use <b>Medical Ultrasound, Non-destructive Testing (NDT), Underwater Imaging, Industrial Sensor, MEMS Components</b>			
Manufacturer's Name <b>Innovia Materials (Shanghai) Co., Ltd</b>		Supplier's Name	
Street Address <b>1333 Luchaogang Road, 6/F</b>		Street Address	
City <b>Shanghai</b>	Province	City	Province
Postal Code <b>201210</b>	Emergency Telephone <b>862158357950</b>	Postal Code	Emergency Telephone <b>+86-21-5835-7950</b>
Date MSDS Prepared <b>26/April/2024</b>	MSDS Prepared By <b>Lirong Ji</b>	Phone Number <b>+86-21-5835-9592</b>	

### SECTION 2 — COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Ingredients ( <i>specific</i> )	%	CAS Number	LD <sub>50</sub> of Ingredient ( <i>specify species and route</i> )	LC <sub>50</sub> of Ingredient ( <i>specify species</i> )
Lead Monoxide (PbO)*	-	1317-36-8	-	-
Titanium Dioxide (TiO <sub>2</sub> )	-	13463-67-7	-	-
Niobium Pentoxide (Nb <sub>2</sub> O <sub>5</sub> )	-	1313-96-8	-	-
Magnesium Oxide (MgO)	-	1309-48-4	-	-

\*This product contains chemicals subject to reporting requirements of Section 313 of the EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT OF 1986 OF 40 CFR 372

### SECTION 3 — HAZARDS IDENTIFICATION

MECHANICAL AND CHEMICAL PROCESS OF PMN-PT PRODUCT MAY RESULT IN TOXIC FINE POWDERS OR DUST  
Potential health effects resulting from the Fine Powder or Dust:

Route of Entry	Reaction	Hazard
Inhalation	The respiratory system may be irritated and both acute and chronic effects and result	
Ingestion	Powder or dust swallowed or contained in the upper respiratory tract through multiple methods (food, tobacco, fingers, etc.) can have acute and chronic effects on blood and kidney functions.	
Skin Contact	May cause irritation to skin.	N/A
Skin Absorption	N/A	N/A
Eye Contact	May cause irritation to eyes.	N/A

## SECTION 4 — FIRST AID MEASURES

Inhalation	Remove from exposure and seek medical attention if experiencing effects from acute overexposure to lead
Ingestion	Induce vomiting in a conscious individual and seek immediate medical attention.
Skin Contact	Wash skin with soap and water.
Skin absorption	N/A
Eye contact	Flush eyes well for 15 minutes, lifting the lower and upper eyelids occasionally. Seek immediate medical attention.

## SECTION 5 — FIRE FIGHTING MEASURES

Flammable NFPA Flammability Rating= 0	If yes, under which conditions?	
Means of Extinction Water, CO <sub>2</sub> , and Dry Chemicals		
Flashpoint (° C) and Method N/A	Upper Flammable Limit (% by volume)	Lower Flammable Limit (% by volume) N/A
Autoignition Temperature (°C) N/A	Explosion Data — Sensitivity to Impact	Explosion Data — Sensitivity to Static Discharge N/A
Hazardous Combustion Products	Product emits toxic fumes under fire conditions and can react quickly with strong oxidizing agents	
Fire Fighting Precautions	Self-contained breathing apparatus, full face piece, and full body protective clothing strongly recommended	

## SECTION 6 — ACCIDENTAL RELEASE MEASURES

Waste Disposal	Disposal of waste obtained through mechanical processing of the PMN-PT materials must be handled in according to local, state and country regulations of hazalrous material.
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## SECTION 7 — HANDLING AND STORAGE

Processing of Material
Wet mechanical processing of the PMN-PT material with incorporation of water cooling to minimize dust exposure is recommended. The PMN-PT material is intended for use only in industrial applications.
Proper handling practices
- Proper PPE equipment utilized (gloves, masks, safety glasses)
- Wash thoroughly after handling product or in contact areas where the product is stored or processed
- Keep materials away from food, food products, and children
- Do not reuse containers
- Do not wear any clothing home that may have come into contact with this material.

## SECTION 8 — EXPOSURE CONTROL / PERSONAL PROTECTION

<b>Specific Engineering Controls</b>	If operations generate dust, ventilation must be used to keep exposure to contaminants to a minimum Ventilation should be in accordance with OSHA requirements, including industry, local, state and country safety requirement
<b>Personal Protective</b>	<b>Specifications</b>
Respirator	Dust/fume respirator compliant to NIOSH/WSHA when handling material
Protective Gloves	Chemical resistant gloves recommended.
Eye Protection	Safety goggles recommended.
Other Clothing and Equipment	Personal clothing should be protected against contamination.

## SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

Physical State <b>Solid</b>	Odour and Appearance <b>Yellow/Green/Brown, Odourless</b>	Odour Threshold (ppm) <b>N/A</b>
Specific Gravity <b>8.0 – 8.2</b>	Vapour Density (air = 1) <b>N/A</b>	Vapour Pressure (mmHg) <b>N/A</b>
Evaporation Rate <b>N/A</b>	Boiling Point (° C) <b>N/A</b>	Melting Point (° C) <b>1300 - 1320° C</b>
pH <b>N/A</b>	Coefficient of Water/Oil Distribution <b>N/A</b>	[Solubility in Water] <b>N/A</b>
Decomposition Temperature <b>700° C</b>	Molecular weight <b>310 to 330</b>	

## SECTION 10 — STABILITY AND REACTIVITY

Chemical Stability <b>NO</b>	If no, under which conditions? <b>Stable to 700° C</b>
Incompatibility with Other Substances <b>NO</b>	If yes, which ones?
Reactivity, and under what conditions? <b>Reacts with Hydrochloric Acid</b>	
Hazardous Decomposition Products <b>N/A</b>	

## SECTION 11 — TOXICOLOGICAL INFORMATION

Routes of Exposure
<b>Eyes, mouth and inhalation of the dust or powder.</b>
Effects of Acute Exposure
<b>Lead poisoning with possible symptoms off abdominal pain, confusion, headache, fatigue and various others. Severe symptoms can result in convulsions, stupor, and encephalopathy, niobium pentoxide may irritate the mucus membranes and skins.</b>
Effects of chronic exposure
<b>Normal adult metabolism can handle and mitigate ingestion of lead from the air, food and beverages until a certain level of toxicity is attained due to cumulative toxic effect of lead. Early symptoms of lead poisoning can include loss of appetite, intermittent abdominal pain, nausea, diarrhea, constipation, and muscle pain. Magnesium compounds may cause metal fume fever of which symptoms are similar to those of common influenza.</b>

## SECTION 12 — ECOLOGICAL INFORMATION

N/A

## SECTION 13 — DISPOSAL CONSIDERATIONS

### Waste Disposal

Disposal of waste obtained through mechanical processing of the PMN-PT material must be handled in accordance with local, state and country regulations of hazardous material.

## SECTION 14 — TRANSPORT INFORMATION

Special Shipping Information		N/A	
N/A			PIN
TDG	N/A	[DOT]	N/A
[IMO]	N/A	[ICAO]	N/A

## SECTION 15 — REGULATORY INFORMATION

[WHMIS Classification] N/A	[OSHA] N/A
[SERA] N/A	[TSCA] N/A

## SECTION 16 — OTHER INFORMATION

Date of Creation: June 1<sup>st</sup>, 2014

Revision: 26 April 2024

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