

Material Safety Data Sheet

Date Printed: 15/SEP/2005
Date Updated: 12/MAY/2005
Version 1.6
According to 91/155/EEC

Classified as Hazardous according to the criteria of EU Annex 1 and NOHSC.

1 - Product and Company Information

Product Name	ZINC OXIDE, NANOPOWDER
Product Number	544906
Company	Sigma-Aldrich Pty. Ltd. 12 Anella Avenue Castle Hill NSW 2154 Australia
Technical Phone #	+61 2 9841 0555 (1800 800 097)
Fax	+61 2 9841 0500 (1800 800 096)
Emergency Phone #	+44 8701906777 (1800 448 465)

2 - Composition/Information on Ingredients

Product Name	CAS #	EC no	Annex I Index Number
ZINC OXIDE	1314-13-2	215-222-5	030-013-00-7
Formula	ZnO		
Molecular Weight	81.39 AMU		
Synonyms	Actox 14 * Actox 16 * Actox 216 * AI3-00277 * Akro-zinc bar 85 * Akro-zinc bar 90 * Amalox * Azo-33 * Azo-55 * Azo-66 * Azo-77 * Azodox-55 * Azodox-55TT * Azo-55TT * Azo-66TT * Azo-77TT * Cadox XX 78 * Chinese White * C.I. 77947 * C.I. Pigment White 4 * Cynku tlenek (Polish) * Electox 2500 * Emanay zinc oxide * EMAR * Felling zinc oxide * Flowers of zinc * GIAP 10 * Green seal-8 * Hubbuck's White * Kadox 15 * Kadox-25 * Kadox 72 * K-Zinc * Outmine * Ozide * Ozlo * Permanent White * Philosopher's wool * Powder base 900 * Protox type 166 * Protox type 167 * Protox type 168 * Protox type 169 * Protox type 267 * Protox type 268 * Red Seal 9 * Snow White * Unichem ZO * Vandem VAC * Vandem VOC * White seal-7 * XX 78 * XX 203 * XX 601 * Zinca 20 * Zincite * Zincoid * Zinc oxide (ACGIH:OSHA) * Zinc oxide fume (OSHA) * Zinc White * ZN-0401 E 3/16'' * Zn 0701T		

3 - Hazards Identification

SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT
Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

4 - First Aid Measures

AFTER INHALATION

If inhaled, remove to fresh air. If breathing becomes difficult, call a physician.

AFTER SKIN CONTACT

In case of contact, immediately wash skin with soap and copious amounts of water.

AFTER EYE CONTACT

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

AFTER INGESTION

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

5 - Fire Fighting Measures

EXTINGUISHING MEDIA

Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

SPECIAL RISKS

Specific Hazard(s): Emits toxic fumes under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

6 - Accidental Release Measures

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Exercise appropriate precautions to minimize direct contact with skin or eyes and prevent inhalation of dust.

METHODS FOR CLEANING UP

Sweep up, place in a bag and hold for waste disposal. Avoid raising dust. Ventilate area and wash spill site after material pickup is complete.

7 - Handling and Storage

HANDLING

Directions for Safe Handling: Avoid inhalation. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

STORAGE

Conditions of Storage: Keep tightly closed.

8 - Exposure Controls / Personal Protection

ENGINEERING CONTROLS

Safety shower and eye bath. Mechanical exhaust required.

GENERAL HYGIENE MEASURES

Wash thoroughly after handling.

EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	5 MG/M3

Poland	NDSCh	10 MG/M3
Poland	NDSP	-

EXPOSURE LIMITS - DENMARK

Source	Type	Value
OEL	TWA	4 mg/m ³

EXPOSURE LIMITS - GERMANY

Source	Type	Value
TRGS 900	OEL	5 mg/m ³ , A

Remarks: 4

EXPOSURE LIMITS - NORWAY

Source	Type	Value
OEL		5 mg/m ³

EXPOSURE LIMITS - SWEDEN

Source	Type	Value
OEL	LLV (Level 5)	mg/m ³

EXPOSURE LIMITS - SWITZERLAND

Source	Type	Value
OEL	OEL	5 mg/m ³

Remarks: A

EXPOSURE LIMITS - UNITED KINGDOM

Source	Type	Value
OEL	OEL	5 mg/m ³
OEL	STEL	10 mg/m ³

PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection: Wear dust mask.

Hand Protection: Protective gloves.

Eye Protection: Chemical safety goggles.

9 - Physical and Chemical Properties

Appearance	Physical State: Solid
	Color: White
	Form: Powder

Property	Value	At Temperature or Pressure
pH	N/A	
BP/BP Range	N/A	
MP/MP Range	N/A	
Flash Point	N/A	
Flammability	N/A	
Autoignition Temp	N/A	
Oxidizing Properties	N/A	
Explosive Properties	N/A	
Explosion Limits	N/A	
Vapor Pressure	N/A	
SG/Density	5.61 g/cm ³	
Partition Coefficient	N/A	
Viscosity	N/A	
Vapor Density	N/A	
Saturated Vapor Conc.	N/A	
Evaporation Rate	N/A	
Bulk Density	N/A	
Decomposition Temp.	N/A	
Solvent Content	N/A	

Water Content	N/A
Surface Tension	N/A
Conductivity	N/A
Miscellaneous Data	N/A
Solubility	N/A

10 - Stability and Reactivity

STABILITY

Stable: Stable.

Materials to Avoid: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Zinc/zinc oxides.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

11 - Toxicological Information

RTECS NUMBER: ZH4810000

ACUTE TOXICITY

LDLO
Oral
Human
500 mg/kg

LD50
Intraperitoneal
Rat
240 MG/KG

LD50
Oral
Mouse
7950 mg/kg

LC50
Inhalation
Mouse
2,500 mg/m³

IRRITATION DATA

Skin
Rabbit
500 mg
24H
Remarks: Mild irritation effect

Eyes
Rabbit
500 mg
24H
Remarks: Mild irritation effect

SIGNS AND SYMPTOMS OF EXPOSURE

Diarrhea, peptic ulceration and gastrointestinal hemorrhage may also occur. Reversible liver enzyme abnormalities. Prolonged exposure can cause: Zinc oxide dust or fume can irritate the

respiratory tract. Prolonged skin contact can produce a severe dermatitis called oxide pox. Exposure to high levels of dust or fume can cause metallic taste, marked thirst, coughing, fatigue, weakness, muscular pain, and nausea followed by fever and chills. Severe overexposure may result in bronchitis or pneumonia with a bluish tint to the skin.

ROUTE OF EXPOSURE

Skin Contact: May cause skin irritation.

Skin Absorption: May be harmful if absorbed through the skin.

Eye Contact: May cause eye irritation.

Inhalation: Material may be irritating to mucous membranes and upper respiratory tract. May be harmful if inhaled.

Ingestion: May be harmful if swallowed.

CHRONIC EXPOSURE - MUTAGEN

Rat

100 UG/M3

Inhalation

Cytogenetic analysis

Hamster

1 MG/L

Cell Type: Embryo

Morphological transformation.

Hamster

1 MG/L

Cell Type: Embryo

Unscheduled DNA synthesis

Hamster

300 UG/L

Cell Type: Embryo

Sister chromatid exchange

Guinea pig

5300 UG/M3/3H/6D

Inhalation

Unscheduled DNA synthesis

CHRONIC EXPOSURE - TERATOGEN

Species: Rat

Dose: 6846 MG/KG

Route of Application: Oral

Exposure Time: (1-22D PREG)

Result: Effects on Newborn: Growth statistics (e.g., reduced weight gain). Effects on Newborn: Stillbirth. Specific Developmental Abnormalities: Homeostasis

12 - Ecological Information

No data available.

13 - Disposal Considerations

SUBSTANCE DISPOSAL

Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an

afterburner and scrubber. Observe all federal, state, and local environmental regulations.

14 - Transport Information

RID/ADR

UN#: 3077
Class: 9
PG: III
Proper Shipping Name: Environmentally hazardous substance, solid, n.o.s

IMDG

UN#: 3077
Class: 9
PG: III
Proper Shipping Name: Environmentally hazardous substance, solid, n.o.s
Marine Pollutant: No
Severe Marine Pollutant: No
Technical Name: Required

IATA

UN#: 3077
Class: 9
PG: III
Proper Shipping Name: Environmentally hazardous substance, solid, n.o.s
Inhalation Packing Group I: No
Technical Name: Required

15 - Regulatory Information

CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES

ANNEX I INDEX NUMBER: 030-013-00-7

INDICATION OF DANGER: N

Dangerous for the environment.

R-PHRASES: 50/53

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S-PHRASES: 60-61

This material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/safety data sheets.

COUNTRY SPECIFIC INFORMATION

Germany

WGK: 2

SWITZERLAND

SWISS POISON CLASS: FREI

16 - Other Information

WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc.,

shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.
Copyright 2005 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

DISCLAIMER

For R&D use only. Not for drug, household or other uses.