

MATERIAL SAFETY DATA SHEET

1. PRODUCT IDENTIFICATION

Product name: NXR-2010 nanoimprint resist (UV-curable)

Revision date: 08/13/2003

Supplier: Nanonex Corporation

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2. Composition

Proprietary.

3. HAZARDS IDENTIFICATION

Label precautionary statements

Flammable (USA)

Highly flammable (EU)

Irritant to eyes, respiratory system and skin.

May cause sensitization by skin contact. Avoid contact with skin.

Target organ(s):

Liver, kidneys

If swallowed, seek medical advice immediately.

Harmful.

4. FIRST AID AND MEASURES

General advice

Take off immediately all contaminated clothing and shoes.

Inhalation

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Seek medical attention.

Eye or skin contact

Immediately flush eyes with copious amounts of water for at least 15 minutes. Assure adequate flushing of the eyes by separating the eyelids with fingers. Seek medical advice.

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

Ingestion

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

The decision if vomiting shall be induced shall be made by the physician. Never give fluids or induce vomiting if the patient is unconscious.

5. FIRE FIGHTING MEASURES

Extinguishing media

Carbon dioxide, dry chemical powder or appropriate foam.

Extinguishing media which must not be used for safety reasons

High volume water jet

Special firefighting procedures

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

Unusual fire and explosions hazards

Flammable liquid.

Emits toxic fumes and oxides of carbon under fire conditions.

Vapor may travel considerable distance to source of ignition and flash back.

Container explosion may occur under fire conditions.

6. ACCIDENTAL RELEASE MEASURES

Evacuate area.

Shut off all sources of ignition.

Wear self-contained breathing apparatus, rubber boots and heavy rubber gloves.

Cover with dry lime, sand or soda ash, pick up, keep in a closed container using non-sparking tools and transport outdoors.

Ventilate area and wash spill site after material pickup is complete.

7. HANDLING AND STORAGE

Keep container tightly closed in a dry, well-ventilated, cool and dark environment. Avoid ignition sources. Avoid dust formation. Do not eat, drink or smoke at workplace.

8. EXPOSURE CONTROL/PERSONAL PROTECTION

Wash thoroughly after handling.

Wash contaminated clothing before reuse.

Wear appropriate NOISH/MSHA-approved respirator, chemical-resistant gloves, safety goggles, other protective clothing.

Avoid contact with eyes, skin and clothing.

Use only in a chemical fume hood.

Safety shower and eye bath.

Do not breathe vapor.

Do not get in eyes, on skin, on clothing.

Avoid prolonged or repeated exposure.

Discard contaminated shoes.

Severe irritant.

Refrigerate.

Store away from heat, sparks and open flame.

Avoid dust formation.

9. PHYSICAL AND CHEMICAL PROPERTIES OF SOLVENT

Appearance and odor

Colorless liquid

Physical properties

Boiling point: 100°C

Melting point: -48°C

Flashpoint: 50°F

Explosion limits in air

Upper 12.5%

Lower 2.12%

Autoignition temperature: 815°F

Vapor pressure: 29 mm, 20°C

Solubility:

Water -Z25245

Chlorinated HYD

Specific gravity: 0.936

Vapor density: 3.5

Odor threshold: 0.05 – 0.21 ppm

Viscosity: 0.63 PAS

Swiss poison class: 4

10. STABILITY AND REACTIVITY

Stability

Stable

Incompatibilities

Heat

May polymerize on exposure to light

Peroxides

Amines

Acids

Bases

Oxidizing agents

Reducing agents

Halogens

Avoid static discharges

Hazardous combustion or decomposition products

Carbon monoxide, carbon dioxide, toxic gases/vapors.

Hazardous polymerization

May undergo autopolymerization.

11. TOXICOLOGICAL INFORMATION

Acute Effects

Cause skin irritation.

Harmful if swallowed, inhaled, or absorbed through skin.

Cause eye irritation.

Lachrymator.

High concentrations are extremely destructive to tissues of the mucous membranes, upper respiratory tract, eyes and skin.

Exposure can cause CNS depression, drowsiness, light-headedness, and irritability.

Symptoms of exposure might also include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea and vomiting.

Ataxia

Narcotic effect

May cause allergic skin reaction.

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

RTECS #: 0Z5075000

Methacrylic acid, methyl ester

Irritation data

SKN-RBT 10 GM/KG OPEN	JIHTAB 23, 343, 1941
EYE-RBT 150 MG	INMEAF 14, 292, 1945
SKN-RBT 500 MG OPEN MLD	UCDS** 3/28/1972
SKN-RBT 500 MG MOD	JTEHD6 19,149,1986
EYE-RBT 1 MG SEV	UCDS** 3/28/1972
EYE-RBT 100 UL/24H SEV	NTIS** OTS0555713

Toxicity data

ORL-RAT LD50:7872 MG/KG	JIHTAB 23, 343, 1941
IHL-RAT LC50: 78000 MG/M3/4H	GTPZAB 20 (6), 5, 1976
IPR-RAT LD50: 1328 MG/KG	JDREAF 51, 1632, 1972
SCU-RAT LD50: 7088 MG/KG	INMEAF 14, 292, 1945
ORL-MUS LD50:3625 MG/KG	GISAAA 41(4),6,1976
IHL-MUS LC50:18500 MG/M3/2H	GTPZAB 20(6),5,1976
IPR-MUS LD50:945 MG/KG	INMEAF 14,292,1945
SCU-MUS LD50:5954 MG/KG	INMEAF 14,292,1945

ORL-DOG LD50:4725 MG/KG	INMEAF 14,292,1945
SCU-DOG LD50:4252 MG/KG	INMEAF 14,292,1945
ORL-RBT LD50:8700 MG/KG	GISAAA 41(4),6,1976
SKN-RBT LD50:>5 GM/KG	NTIS** OTS0544282
ORL-GPG LD50:5954 MG/KG	INMEAF 14,292,1945
IPR-GPG LD50:1890 MG/KG	INMEAF 14,292,1945
SCU-GPG LD50:5954 MG/KG	INMEAF 14,292,1945
IHL-MAM LC50:20 GM/M3	GISAAA 51(5),61,1986
ORL-RAT LD50:1830 MG/KG	NTIS** OTS0555713
IPR-RAT LD50:25 MG/KG	NTIS** OTS0555706
SKN-RBT LD50:4 ML/KG	TXAPA9 28,313,1974

Target organ data

Liver

Kidneys

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIN, NTP or EPA classification.

Behavioral (Sleep)

Behavioral (Somnolence)

Behavioral (Excitement)

Behavioral (Anorexia, human)

Behavioral (Ataxia)

Specific developmental abnormalities (Musculoskeletal system)

Specific developmental abnormalities (Other developmental abnormalities)

Tumorigenic (Equivocal tumorigenic agent by RTECS criteria)

Tumorigenic (Tumors at site of application)

Gastrointestinal (Ulceration or bleeding from small intestine)

Gastrointestinal (Ulceration or bleeding from large intestine)

Gastrointestinal (Other changes)

Skin and appendages (Hair)

Maternal effects (Other effects on female)

Effects on fertility (Post-implantation mortality)

Effects on embryo or fetus (Fetotoxicity, possible risk of congenital malfunction, even fetal death)

Only selected registry of toxic effects of chemical substances (RTECS) data is presented here.

12. ECOLOGICAL INFORMATION

Acute toxicity to fish	LC50 24mg/l	EEC C 1
Zebra fish (Brachydanio rerio) 96h		
Acute toxicity to daphnia	EC50 105mg/l	EEC C 2

Daphnia magna 24h	
Acute toxicity to bacteria	IC50 >100mg/l
Sewage sludge 3h	
Acute toxicity to algae	not tested
Biodegradability	readily biodegradable EEC C 5
Ecotoxic effects	
Do not discharge product uncontrolled into the environment.	
13. DISPOSAL CONSIDERATION	
Waste from residues/unused product	
Can be incinerated in a chemical incinerator equipped with an afterburner and scrubber. But exert extra care in igniting as this material is highly flammable.	
Contaminated packaging	
Empty containers should be transported/delivered using a registered waste carrier for local recycling or waste disposal.	
Observe all federal, state and local environmental regulations.	
14. TRANSPORT INFORMATION	
Contact Nanonex Corporation for transportation information.	
15. REGULATORY INFORMATION	
European Information	
EC index #: 607-035-00-6	
Highly flammable	
Irritant	
R11	
Highly flammable	
R 37/38	
Irritating to respiratory system and skin	
R 43	
May cause sensitization by skin contact	
S 24	
Avoid contact with skin	
S 37	
Wear suitable gloves	
S 46	
If swallowed, seek medical advice immediately.	
EC index #: 607-110-00-3	
Harmful	

R 36/38

Irritating to eyes and skin

R 43

May cause sensitization by skin contact

S 39

Wear eye/face protection.

Reviews, Standards, and Regulations

OEL=MAK

ACGIH TLV-Not classifiable as a human carcinogen DTLVS* TLV/BEI,1999

ACGIH TLV-TWA 100 PPM DTLVS* TLV/BEI,1999

IARC Cancer Review: Animal Inadequate Evidence IMEMDT 19,187,1979

IARC Cancer Review: Human No Adequate Data IMEMDT 19,187,1979

IARC Cancer Review: Human Inadequate Evidence IMEMDT 60,445,1994

IARC Cancer Review: Animal Lack Carcinogenicity IMEMDT 60,445,1994

IARC Cancer Review: Group 3 IMEMDT 60,445,1994

MSHA Standard-air: TWA 100 PPM (410 MG/M3)

DTLVS* 3,168,1971

OSHA PEL (GEN INDU):8H TWA 100 PPM (410 MG/M3)

CFRGBR 29,1910.1000,1994

OSHA PEL (CONSTRUC):8H TWA 100 PPM (410 MG/M3)

CFRGBR 29,1926.55,1994

OSHA PEL (SHIPYARD):8H TWA 100 PPM (410 MG/M3)

CFRGBR 29,1915.1000,1993

OSHA PEL (FED CONT):8H TWA 100 PPM (410 MG/M3)

CFRGBR 41,50-204.50,1994

OEL-AUSTRALIA: TWA 100 PPM (410 MG/M3), JAN1993

OEL-AUSTRIA: MAK 50 PPM (210 MG/M3), JAN1999

OEL-BELGIUM: TWA 100 PPM (410 MG/M3), JAN1993

OEL-FINLAND: TWA 100 PPM (410 MG/M3), STEL 150 PPM (615 MG/M3), JAN1999

OEL-FRANCE: VME 100 PPM (410 MG/M3), VLE 200 PPM (820 MG/M3), JAN1999

OEL-GERMANY: MAK 50 PPM (210 MG/M3), JAN1999

OEL-HUNGARY: TWA 50 MG/M3, STEL 150 MG/M3, JAN1993

OEL-THE NETHERLANDS: MAC-TGG 100 PPM (410 MG/M3), JAN1999

OEL-NORWAY: TWA 25 PPM (100 MG/M), JAN1999

OEL-THE PHILIPPINES: TWA 100 PPM (410 MG/M3), JAN1993

OEL-POLAND: MAC(TWA) 50 MG/M3, MAC(STEL) 400 MG/M3, JAN1999

OEL-RUSSIA: STEL 10 MG/M3, JAN1993

OEL-SWEDEN: NGV 50 PPM (200 MG/M3), KTV 150 PPM (600 MG/M3), SKIN, JAN1999
OEL-SWITZERLAND: MAK-W 50 PPM (210 MG/M3), KZG-W 100 PPM (420 MG/M3),
JAN1999
OEL-UNITED KINGDOM: TWA 50 PPM (208 MG/M3), STEL 100 PPM, SEP2000
OEL IN ARGENTINA, BULGARIA, COLOMBIA, JORDAN, KOREA CHECK ACGIH TLV;
OEL IN NEW ZEALAND, SINGAPORE, VIETNAM CHECK ACGIH TLV
NIOSH REL TO AIR:10H TWA 100 PPM
NIOSH* DHHS #92-100,1992
NOHS 1974: HZD 47700; NIS 89; TNF 11522; NOS 73; TNE 89435
NOHS 1974: HZD M1224; NIS 2; TNF 56; NOS 3; TNE 138
NOES 1983: HZD 47700; NIS 76; TNF 6757; NOS 80; TNE 170079; TFE 59519
NOES 1983: HZD M1224; NIS 1; TNF 21; NOS 1; TNE 62; TFE 41
EPA TSCA Section 8(B) Chemical Inventory
EPA TSCA 8(A) Preliminary Assessment Information, Final Rule FEREAC 47,26992,82
EPA TSCA Section 8(D) Unpublished Health/Safety Studies On EPA IRIS Database
EPA TSCA Test Submission (TSCATS) Data Base, January 2001
NTP Carcinogenesis Studies (inhalation); No evidence: mouse, rat
NTP Carcinogenesis Studies; On Test (Prechronic Studies), October 2000
NTP Carcinogenesis Studies; Test Completed (Peer Review), October 2000
NTPTR* NTP-TR-314,1986
U.S. Information
This product is subject to SARA SECTION 313 reporting requirements.

16. OTHER INFORMATION

The above information is believed to be correct, but does not purport to be all inclusive and shall be used only as a guide. Nanonex shall not be held liable for any damage resulting from handling or from contact with the above product.