N-Nitrosobis(2-hydroxypropyl)amine: sc-208052

MATERIAL SAFETY DATA SHEET

Section 1 - General Information
Chemical Name:
N-Nitrosobis(2-hydroxypropyl)amine
CAS Reg. Number:
53609-64-6
Catalog Number:
sc-208052
Supplier:
Santa Cruz Biotechnology, Inc.
2145 Delaware Avenue
Santa Cruz, CA 95060
800.457.3801 or 831.457.3800
Emergency:
ChemWatch
Within the US & Canada: 877-715-9305
Outside the US & Canada: +800 2436 2255
(1-800-CHEMCALL) or call +613 9573 3112

Section 2 - Hazardous Ingredients/Identity Information
To the best of our knowledge the chemical, physical, and toxicological properties have not been thoroughly investigated. Exercise due care. COMPOUND DESCRIPTOR : Tumorigen: Mutagen : Reproductive Effector

Section 3 - Physical/Chemical Characteristics
Boiling Point:
N/A
Apearance and Odor:
Thick yellow oil
Vapor Pressure:
N/A
Specific Gravity(H2O=1):
N/A
Solubility in Water:
N/A
Melting Point:
N/A
Evaporation Rate (ButylAcetate=1):
N/A
Vapor Density:
N/A
Molecular Weight:
162.19
Molecular Formula:
$C_6H_{14}N_2O_3$

Section 4 - Reactive Data
Stability:
Stable
Incompatability (Materials to Avoid):
strong oxidizing agents
Conditions to Avoid:
Strong oxidizers
Hazardous Decomposition or Byproducts:
toxic fumes of: carbon monoxide, carbon dioxide nitrogen oxides and sulfur oxides
Hazardous Polymerization:
will not occur

Section 5 - Control Measures
Respiratory Protection:
Niosh/Msha approved respirator
Ventilation:
hood

Protective Gloves:
Chemical Resistant Gloves
Eye Protection:
no data available
Other Protective Clothing:
lab coat and apron
Other Protection:
safety shower, eye wash

Section 6 - First Aid Measures
Inhalation:
Remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.
Skin:
Immediately flush skin with copious amounts of water for at least 15 min while removing contaminated clothing and shoes.
Ingestion:
If swallowed, wash out mouth with water provided person is conscious. Call a physician. Remove and wash contaminated clothing immediately.
Eyes:
Immediately flush eyes with copious amounts of water for at least 15 min. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Section 7 - Health Hazard Data
Health Hazards (Acute and Chronic):
TYPE OF TEST : LD50 - Lethal dose, 50 percent kill ROUTE OF EXPOSURE : Subcutaneous SPECIES OBSERVED : Rodent - rat DOSE/DURATION : 5 gm/kg TOXIC EFFECTS : Lungs, Thorax, or Respiration - other changes Gastrointestinal - ulceration or bleeding from stomach Gastrointestinal - ulceration or bleeding from large intestine REFERENCE : JJIND8 JNCI, Journal of the National Cancer Institute. (Washington, DC) V.61-79, 1978-87. For publisher information, see JNCIEQ. Volume(issue)/page/year: 63,181,1979 TYPE OF TEST : LD50 - Lethal dose, 50 percent kill ROUTE OF EXPOSURE : Subcutaneous SPECIES OBSERVED : Rodent - mouse DOSE/DURATION : 5160 mg/kg TOXIC EFFECTS : Details of toxic effects not reported other than lethal dose value REFERENCE : CALEDQ Cancer Letters (Shannon, Ireland). (Elsevier Scientific Pub. Ireland Ltd., POB 85, Limerick, Ireland) V.1- 1975- Volume(issue)/page/year: 9,257,1980 TYPE OF TEST : LD50 - Lethal dose, 50 percent kill ROUTE OF EXPOSURE : Subcutaneous SPECIES OBSERVED : Rodent - guinea pig DOSE/DURATION : 4900 mg/kg TOXIC EFFECTS : Lungs, Thorax, or Respiration - other changes Liver - hepatitis (hepatocellular necrosis), zonal Blood - hemorrhage REFERENCE : JNCIAM Journal of the National Cancer Institute. (Washington, DC) V.1-60, 1940-78. For publisher information, see JJIND8. Volume(issue)/page/year: 58,387,1977 ** TUMORIGENIC DATA ** TYPE OF TEST : TDLo - Lowest published toxic dose ROUTE OF EXPOSURE : Oral SPECIES OBSERVED : Rodent - rat DOSE/DURATION : 4600 mg/kg/42W-C TOXIC EFFECTS : Tumorigenic - Carcinogenic by RTECS criteria Sense Organs and Special Senses (Olfaction) - tumors Gastrointestinal - tumors REFERENCE : CRNGDP Carcinogenesis (London). (Oxford Univ. Press, Pinkhill House, Southfield Road, Eynsham, Oxford OX8 1JJ, UK) V.1- 1980- Volume(issue)/page/year: 5,167,1984 TYPE OF TEST : TDLo - Lowest published toxic dose ROUTE OF EXPOSURE : Intraperitoneal SPECIES OBSERVED : Rodent - rat DOSE/DURATION : 9333 ug/kg/24W-I TOXIC EFFECTS : Tumorigenic - Carcinogenic by RTECS criteria Gastrointestinal - tumors REFERENCE : SJGRA4 Scandinavian Journal of Gastroenterology. (Columbia Univ. Press, POB 258, Irvington-on-Hudson, NY 10533) V.1- 1966- Volume(issue)/page/year: 14,217,1979 TYPE OF TEST : TDLo - Lowest published toxic dose ROUTE OF EXPOSURE : Subcutaneous SPECIES OBSERVED : Rodent - rat DOSE/DURATION : 1400 mg/kg/2W-I TOXIC EFFECTS : Tumorigenic - Carcinogenic by RTECS criteria Endocrine - thyroid tumors REFERENCE : CTRRDO Cancer Treatment Reports. (Washington, DC) V.60-71, 1976-87. For publisher information, see JNCIEQ. Volume(issue)/page/year: 63,1181,1979 TYPE OF TEST : TDLo - Lowest published toxic dose ROUTE OF EXPOSURE : Oral SPECIES OBSERVED : Rodent - mouse DOSE/DURATION : 28 gm/kg/16W-I TOXIC EFFECTS : Tumorigenic - neoplastic by RTECS criteria Lungs, Thorax, or Respiration - tumors Liver - tumors REFERENCE : CALEDQ Cancer Letters (Shannon, Ireland). (Elsevier Scientific Pub. Ireland Ltd., POB 85, Limerick, Ireland) V.1- 1975- Volume(issue)/page/year: 3,255,1977 TYPE OF TEST : TDLo - Lowest published toxic dose ROUTE OF EXPOSURE : Intraperitoneal SPECIES OBSERVED : Rodent - mouse DOSE/DURATION : 125 mg/kg TOXIC EFFECTS : Tumorigenic - Carcinogenic by RTECS criteria Lungs, Thorax, or Respiration - tumors Liver - tumors REFERENCE : JTSCDR Journal of Toxicological Sciences. (Japanese Soc. of Toxicological Sciences, 4th Floor, Gakkai Center Bldg., 4-16, Yayoi 2-chome, Bunkyo-ku, Tokyo 113, Japan) V.1- 1976- Volume(issue)/page/year: 10,315,1985 TYPE OF TEST : TDLo - Lowest published toxic dose ROUTE OF EXPOSURE : Subcutaneous SPECIES OBSERVED : Rodent - mouse DOSE/DURATION : 6049 mg/kg/23W-I TOXIC EFFECTS : Tumorigenic - Carcinogenic by RTECS criteria Lungs, Thorax, or Respiration - bronchiogenic carcinoma Liver - tumors REFERENCE : CALEDQ Cancer Letters (Shannon, Ireland). (Elsevier Scientific Pub. Ireland Ltd., POB 85, Limerick, Ireland) V.1- 1975- Volume(issue)/page/year: 9,257,1980 TYPE OF TEST : TDLo - Lowest published toxic dose ROUTE OF EXPOSURE : Intramuscular SPECIES OBSERVED : Rodent - mouse DOSE/DURATION : 125 mg/kg TOXIC EFFECTS : Tumorigenic - equivocal tumorigenic agent by RTECS criteria Blood - tumors Skin and Appendages - tumors REFERENCE : IGSBAL Igaku to Seibutsugaku. Medicine and Biology. (c/o Ogato Igaku Kagaku Kenkyusho, 2-3-5 Bakuro-cho, Nihonbashi, Chuo-ku, Tokyo 103, Japan) V.1- 1942- Volume(issue)/page/year: 109,99,1984 TYPE OF TEST : TDLo - Lowest published toxic dose ROUTE OF EXPOSURE : Oral SPECIES OBSERVED : Rodent - rabbit DOSE/DURATION : 29 gm/kg/25W-C TOXIC

EFFECTS : Tumorigenic - Carcinogenic by RTECS criteria Lungs, Thorax, or Respiration - tumors Liver - tumors REFERENCE : CALEDQ Cancer Letters (Shannon, Ireland). (Elsevier Scientific Pub. Ireland Ltd., POB 85, Limerick, Ireland) V.1- 1975- Volume(issue)/page/year: 5,339,1978 TYPE OF TEST : TDLo - Lowest published toxic dose ROUTE OF EXPOSURE : Subcutaneous SPECIES OBSERVED : Rodent - guinea pig DOSE/DURATION : 7500 mg/kg/30W-I TOXIC EFFECTS : Tumorigenic - Carcinogenic by RTECS criteria Liver - tumors Liver - angiosarcoma REFERENCE : JNCIAM Journal of the National Cancer Institute. (Washington, DC) V.1-60, 1940-78. For publisher information, see JJIND8. Volume(issue)/page/year: 58,387,1977 TYPE OF TEST : TDLo - Lowest published toxic dose ROUTE OF EXPOSURE : Oral SPECIES OBSERVED : Rodent - hamster DOSE/DURATION : 1875 mg/kg/15W-I TOXIC EFFECTS : Tumorigenic - Carcinogenic by RTECS criteria Gastrointestinal - tumors REFERENCE : CNREA8 Cancer Research. (Public Ledger Building, Suit 816, 6th & Chestnut Sts., Philadelphia, PA 19106) V.1- 1941- Volume(issue)/page/year: 41,4715,1981 TYPE OF TEST : TDLo - Lowest published toxic dose ROUTE OF EXPOSURE : Administration onto the skin SPECIES OBSERVED : Rodent - hamster DOSE/DURATION : 688 mg/kg/43W-I TOXIC EFFECTS : Tumorigenic - Carcinogenic by RTECS criteria Sense Organs and Special Senses (Olfaction) - tumors Gastrointestinal - tumors REFERENCE : CALEDQ Cancer Letters (Shannon, Ireland). (Elsevier Scientific Pub. Ireland Ltd., POB 85, Limerick, Ireland) V.1- 1975- Volume(issue)/page/year: 10,365,1980 TYPE OF TEST : TDLo - Lowest published toxic dose ROUTE OF EXPOSURE : Subcutaneous SPECIES OBSERVED : Rodent - hamster DOSE/DURATION : 2375 mg/kg/19W-I TOXIC EFFECTS : Tumorigenic - Carcinogenic by RTECS criteria Gastrointestinal - tumors Liver - tumors REFERENCE : CANCAR Cancer (Philadelphia). (Lippincott/Harper, Journal Fulfillment Dept., 2350 Virginia Ave., Hagerstown, MD 21740) V.1- 1948- Volume(issue)/page/year: 36,379,1975 TYPE OF TEST : TDLo - Lowest published toxic dose ROUTE OF EXPOSURE : Subcutaneous SPECIES OBSERVED : Rodent - hamster DOSE/DURATION : 100 mg/kg female 14 day(s) after conception TOXIC EFFECTS : Tumorigenic - neoplastic by RTECS criteria Reproductive - Tumorigenic effects - transplacental tumorigenesis Endocrine - tumors REFERENCE : ZKKOBW Zeitschrift fuer Krebsforschung und Klinische Onkologie. (Berlin, Fed. Rep. Ger.) V.76-92, 1971-78. For publisher information, see JCROD7. Volume(issue)/page/year: 90,119,1977 TYPE OF TEST : TDLo - Lowest published toxic dose ROUTE OF EXPOSURE : Implant SPECIES OBSERVED : Rodent - hamster DOSE/DURATION : 950 mg/kg/7D-C TOXIC EFFECTS : Tumorigenic - equivocal tumorigenic agent by RTECS criteria Gastrointestinal - tumors Liver - tumors REFERENCE : CRNGDP Carcinogenesis (London). (Oxford Univ. Press, Pinkhill House, Southfield Road, Eynsham, Oxford OX8 1JJ, UK) V.1- 1980- Volume(issue)/page/year: 10,699,1989 TYPE OF TEST : TDLo - Lowest published toxic dose ROUTE OF EXPOSURE : Subcutaneous SPECIES OBSERVED : Mammal - species unspecified DOSE/DURATION : 20 gm/kg/80W-I TOXIC EFFECTS : Tumorigenic - Carcinogenic by RTECS criteria Lungs, Thorax, or Respiration - bronchiogenic carcinoma Liver - tumors REFERENCE : JJIND8 JNCI, Journal of the National Cancer Institute. (Washington, DC) V.61-79, 1978-87. For publisher information, see JNCIEQ. Volume(issue)/page/year: 65,835,1980 TYPE OF TEST : TD - Toxic dose (other than lowest) ROUTE OF EXPOSURE : Subcutaneous SPECIES OBSERVED : Rodent - hamster DOSE/DURATION : 4125 mg/kg/33W-I TOXIC EFFECTS : Tumorigenic - Carcinogenic by RTECS criteria Gastrointestinal - tumors Liver - tumors REFERENCE : CANCAR Cancer (Philadelphia). (Lippincott/Harper, Journal Fulfillment Dept., 2350 Virginia Ave., Hagerstown, MD 21740) V.1- 1948- Volume(issue)/page/year: 36,379,1975 TYPE OF TEST : TD - Toxic dose (other than lowest) ROUTE OF EXPOSURE : Subcutaneous SPECIES OBSERVED : Rodent - hamster DOSE/DURATION : 2750 mg/kg/34W-I TOXIC EFFECTS : Tumorigenic - Carcinogenic by RTECS criteria Lungs, Thorax, or Respiration - tumors Gastrointestinal - tumors REFERENCE : ZKKOBW Zeitschrift fuer Krebsforschung und Klinische Onkologie. (Berlin, Fed. Rep. Ger.) V.76-92, 1971-78. For publisher information, see JCROD7. Volume(issue)/page/year: 90,141,1977 TYPE OF TEST : TD - Toxic dose (other than lowest) ROUTE OF EXPOSURE : Subcutaneous SPECIES OBSERVED : Rodent - hamster DOSE/DURATION : 5250 mg/kg/15W-I TOXIC EFFECTS : Tumorigenic - Carcinogenic by RTECS criteria Gastrointestinal - tumors REFERENCE : CRNGDP Carcinogenesis (London). (Oxford Univ. Press, Pinkhill House, Southfield Road, Eynsham, Oxford OX8 1JJ, UK) V.1- 1980- Volume(issue)/page/year: 7,801,1986 TYPE OF TEST : TD - Toxic dose (other than lowest) ROUTE OF EXPOSURE : Subcutaneous SPECIES OBSERVED : Rodent - rat DOSE/DURATION : 3000 mg/kg TOXIC EFFECTS : Tumorigenic - Carcinogenic by RTECS criteria Lungs, Thorax, or Respiration - tumors REFERENCE : IGAYAY Igaku No Ayumi. Progress in Medicine. (Ishiyaku Shuppan K.K., 1-7-10, Honkomagom, Bunkyo-ku, Tokyo, Japan) V.1- 1946- Volume(issue)/page/year: 107,248,1978 TYPE OF TEST : TD - Toxic dose (other than lowest) ROUTE OF EXPOSURE : Intraperitoneal SPECIES OBSERVED : Rodent - rat DOSE/DURATION : 2800 mg/kg TOXIC EFFECTS : Tumorigenic - neoplastic by RTECS criteria Kidney, Ureter, Bladder - Kidney tumors Endocrine - thyroid tumors REFERENCE : JJIND8 JNCI, Journal of the National Cancer Institute. (Washington, DC) V.61-79, 1978-87. For publisher information, see JNCIEQ. Volume(issue)/page/year: 72,471,1984 TYPE OF TEST : TD - Toxic dose (other than lowest) ROUTE OF EXPOSURE : Subcutaneous SPECIES OBSERVED : Rodent - rat DOSE/DURATION : 14000 mg/kg/20W-I TOXIC EFFECTS : Tumorigenic - Carcinogenic by RTECS criteria Endocrine - thyroid tumors REFERENCE : NAIZAM Nara Igaku Zasshi. Journal of the Nara Medical Association. (Nara Igakkai, c/o Narakenritsu Ika Daigaku, Shijo-cho, Kashihara, Nara-ken, Japan) V.1- 1950- Volume(issue)/page/year: 32,670,1981 TYPE OF TEST : TD - Toxic dose (other than lowest) ROUTE OF EXPOSURE : Subcutaneous SPECIES OBSERVED : Rodent - rat DOSE/DURATION : 3560 mg/kg/20W-I TOXIC EFFECTS : Tumorigenic - Carcinogenic by RTECS criteria Sense Organs and Special

Senses (Olfaction) - tumors Gastrointestinal - tumors REFERENCE : JNCIAM Journal of the National Cancer Institute. (Washington, DC) V.1-60, 1940-78. For publisher information, see JJIND8. Volume(issue)/page/year: 58,361,1977 TYPE OF TEST : TD - Toxic dose (other than lowest) ROUTE OF EXPOSURE : Intraperitoneal SPECIES OBSERVED : Rodent - rat DOSE/DURATION : 2000 mg/kg TOXIC EFFECTS : Tumorigenic - Carcinogenic by RTECS criteria Lungs, Thorax, or Respiration - tumors Endocrine - thyroid tumors REFERENCE : IAPUDO IARC Publications. (WHO Publications Centre USA, 49 Sheridan Ave., Albany, NY 12210) No.27- 1979- Volume(issue)/page/year: 41,611,1982 TYPE OF TEST : TD - Toxic dose (other than lowest) ROUTE OF EXPOSURE : Subcutaneous SPECIES OBSERVED : Rodent - hamster DOSE/DURATION : 500 mg/kg TOXIC EFFECTS : Tumorigenic - Carcinogenic by RTECS criteria Gastrointestinal - tumors Liver - tumors REFERENCE : JCROD7 Journal of Cancer Research and Clinical Oncology. (Springer-Verlag New York, Inc., Service Center, 44 Hartz Way, Secaucus, NJ 07094) V.93-1979- Volume(issue)/page/year: 102,265,1982 TYPE OF TEST : TD - Toxic dose (other than lowest) ROUTE OF EXPOSURE : Subcutaneous SPECIES OBSERVED : Rodent - hamster DOSE/DURATION : 2500 mg/kg/5W-I TOXIC EFFECTS : Tumorigenic - Carcinogenic by RTECS criteria Gastrointestinal - tumors REFERENCE : JJCREP Japanese Journal of Cancer Research. (Elsevier Science Pub. BV, POB 211, 1000 AE Amsterdam, Netherlands) V.76- 1985- Volume(issue)/page/year: 82,793,1991 ** MUTATION DATA ** TYPE OF TEST : Mutation in microorganisms TEST SYSTEM : Bacteria - Salmonella typhimurium DOSE/DURATION : 250 ug/plate REFERENCE : MUREAV Mutation Research. (Elsevier Science Pub. B.V., POB 211, 1000 AE Amsterdam, Netherlands) V.1- 1964- Volume(issue)/page/year: 111,135,1983 TYPE OF TEST : Morphological transformation TEST SYSTEM : Human Cells - not otherwise specified DOSE/DURATION : 5 mg/L REFERENCE : BANRDU Banbury Report. (Cold Spring Harbor Laboratory, POB 100, Cold Spring Harbor, NY 11724) V.1- 1979- Volume(issue)/page/year: 12,15,1982 TYPE OF TEST : Unscheduled DNA synthesis TEST SYSTEM : Rodent - rat Liver DOSE/DURATION : 5 mmol/L REFERENCE : MUREAV Mutation Research. (Elsevier Science Pub. B.V., POB 211, 1000 AE Amsterdam, Netherlands) V.1- 1964- Volume(issue)/page/year: 144,197,1985 TYPE OF TEST : Mutation in microorganisms TEST SYSTEM : Rodent - hamster Lung DOSE/DURATION : 6500 umol/L REFERENCE : MUREAV Mutation Research. (Elsevier Science Pub. B.V., POB 211, 1000 AE Amsterdam, Netherlands) V.1- 1964- Volume(issue)/page/year: 163,303,1986 TYPE OF TEST : DNA damage TEST SYSTEM : Rodent - hamster Lung DOSE/DURATION : 2 mmol/L REFERENCE : CRNGDP Carcinogenesis (London). (Oxford Univ. Press, Pinkhill House, Southfield Road, Eynsham, Oxford OX8 1JJ, UK) V.1- 1980- Volume(issue)/page/year: 13,223,1992 TYPE OF TEST : Mutation in mammalian somatic cells TEST SYSTEM : Rodent - hamster Lung DOSE/DURATION : 700 umol/L REFERENCE : CNREA8 Cancer Research. (Public Ledger Building, Suit 816, 6th & Chestnut Sts., Philadelphia, PA 19106) V.1- 1941- Volume(issue)/page/year: 40,3463,1980 TYPE OF TEST : Host-mediated assay TEST SYSTEM : Rodent - hamster Bacteria - Salmonella typhimurium DOSE/DURATION : 400 mg/kg REFERENCE : CRNGDP Carcinogenesis (London). (Oxford Univ. Press, Pinkhill House, Southfield Road, Eynsham, Oxford OX8 1JJ, UK) V.1- 1980- Volume(issue)/page/year: 14,1621,1993 *** REVIEWS *** TOXICOLOGY REVIEW APLMAS Archives of Pathology and Laboratory Medicine. (AMA, 535 N. Dearborn St., Chicago, IL 60610) V.1-5(2), 1926-28; V.100- 1976- Volume(issue)/page/year: 107,54,1983

Medical Conditions Generally Aggravated by Exposure:

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

Section 8 - Precautions for Safe Handling and Use

Steps to be Taken in Case Material is Released or Spilled:

Wear respirator, chemical safety goggles, rubber boots and heavy rubber gloves. Sweep up, place in a bag and hold for waste disposal. Avoid raising dust.

Waste Disposal Method:

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.

Precautions to Be Taken in Handling and Storage:

Keep tightly closed. Store in a cool dry place. Possible mutagen. Irritant.

Section 9 - Fire and Explosion Hazard Data

Extinguishing Media:

Water spray. Carbon Dioxide, dry chemical powder or appropriate foam.

Special Fire Fighting Procedures:

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

Unusual Fire and Explosion Hazards:

Emits Toxic fumes under fire conditions.

Section 10 - Transportation Information and regulatory information

Transportation Information DOT Proper Shipping Name: None Non-Hazardous for Transport: This substance is considered to be non-hazardous for transport. IATA Non-Hazardous for Air Transport: Non-hazardous for air transport.

The above information is believed to be correct but does not purport to be complete and should be used only as a guide. The burden of safe use of this material rests entirely with the user.

5/12/2010