

MATERIAL SAFETY DATA SHEET

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Version 1.4

Section 1 - Product and Company Information

Product Name NITROFURANTOIN
Product Number N7878
Brand SIGMA

Company Sigma-Aldrich
Address 3050 Spruce Street
SAINT LOUIS MO 63103 US

Technical Phone: 800-325-5832
Fax: 800-325-5052
Emergency Phone: 314-776-6555

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313 No
NITROFURANTOIN	67-20-9	

Formula C8H6N4O5

Synonyms Berkfurin * Chemiofuran * Cyantin * Dantafur *
Furadantin * Furadantoin * Furadonin * Furadonine
* Furantoin * Furatoin * Furobactina *
2,4-Imidazolidinedione,
1-(((5-nitro-2-furanyl)methylene)amino)- * Ituran
* Macrobid * Macrofantin * NCI-C55196 *
Nifurantin * Nitrofurantoin *
N-(5-Nitrofurfurylidene)-1-aminohydantoin *
N-(5-Nitro-2-furfurylidene)-1-aminohydantoin *
1-((5-Nitrofurfurylidene)amino)hydantoin *
N-(5-Nitro-2-furfurylideno)-1-aminohydantoina
(Polish) * NSC 2107 * Orafuran * Urizept * USAF
EA-2 * Welfurin * Zoofurin

RTECS Number: MU2800000

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Harmful.

May cause sensitization by inhalation and skin contact. Harmful if
swallowed.Target organ(s): Liver. Nerves. Calif. Prop. 65 developmental
hazard.

HMIS RATING

HEALTH: 3*

FLAMMABILITY: 0

REACTIVITY: 1

NFPA RATING

HEALTH: 3

FLAMMABILITY: 0

REACTIVITY: 1

*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

ORAL EXPOSURE

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

INHALATION EXPOSURE

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

DERMAL EXPOSURE

In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

EYE EXPOSURE

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.

Section 5 - Fire Fighting Measures

FLASH POINT

N/A

AUTOIGNITION TEMP

N/A

FLAMMABILITY

N/A

EXTINGUISHING MEDIA

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

FIREFIGHTING

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s): Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear respirator, chemical safety goggles, rubber boots, and heavy rubber gloves.

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.

Section 7 - Handling and Storage

HANDLING

User Exposure: Avoid breathing dust. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

STORAGE

Suitable: Keep tightly closed.

SPECIAL REQUIREMENTS

Light sensitive.

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS

Mechanical exhaust required.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a dust mask type N95 (US) or type P1 (EN 143) respirator.

Other: Wear appropriate government approved respirator, chemical-resistant gloves, safety goggles, other protective clothing.

GENERAL HYGIENE MEASURES

Wash thoroughly after handling. Wash contaminated clothing before reuse.

Section 9 - Physical/Chemical Properties

Appearance	Physical State: Solid Color: Yellow	
Property	Value	At Temperature or Pressure
Molecular Weight	238.16 AMU	
pH	N/A	
BP/BP Range	N/A	
MP/MP Range	268 °C	
Freezing Point	N/A	
Vapor Pressure	N/A	
Vapor Density	N/A	
Saturated Vapor Conc.	N/A	
SG/Density	N/A	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Surface Tension	N/A	
Partition Coefficient	N/A	
Decomposition Temp.	N/A	
Flash Point	N/A	
Explosion Limits	N/A	
Flammability	N/A	
Autoignition Temp	N/A	
Refractive Index	N/A	
Optical Rotation	N/A	
Miscellaneous Data	N/A	
Solubility	Solubility in Water: Insoluble.	

N/A = not available

Section 10 - Stability and Reactivity

STABILITY

Stable: Stable.

Materials to Avoid: Strong oxidizing agents, Strong acids, Strong bases.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide, Nitrogen oxides.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

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: Harmful if swallowed.

SENSITIZATION

Respiratory: May cause allergic respiratory reaction.

Skin: May cause allergic skin reaction.

TARGET ORGAN(S) OR SYSTEM(S)

Liver. Nerves. Blood. Lungs. Kidneys. Reproductive system.

SIGNS AND SYMPTOMS OF EXPOSURE

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

TOXICITY DATA

Oral
Rat
604 mg/kg
LD50

Intraperitoneal
Rat
112 MG/KG
LD50

Oral
Mouse
360 mg/kg
LD50

Intraperitoneal
Mouse
100 MG/KG
LD50

Oral
Chicken
53 mg/kg
LD50

CHRONIC EXPOSURE - CARCINOGEN

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

Species: Rat

Route of Application: Oral

Dose: 10815 MG/KG

Exposure Time: 2Y

Frequency: C

Result: Kidney, Ureter, Bladder:Tumors. Tumorigenic:Neoplastic by RTECS criteria.

Species: Mouse

Route of Application: Oral

Dose: 21630 MG/KG

Exposure Time: 2Y

Frequency: C

Result: Tumorigenic Effects: Ovarian tumors. Tumorigenic:Carcinogenic by RTECS criteria.

Species: Rat

Route of Application: Oral

Dose: 135 GM/KG

Exposure Time: 2Y

Frequency: C

Result: Tumorigenic:Neoplastic by RTECS criteria. Skin and Appendages: Other: Tumors.

IARC CARCINOGEN LIST

Rating: Group 3

NTP CARCINOGEN LIST

Rating: Clear evidence.

Species: Mouse

Route: Feed

CHRONIC EXPOSURE - TERATOGEN

Species: Mouse

Dose: 75 MG/KG

Route of Application: Subcutaneous

Exposure Time: (9-11D PREG)

Result: Specific Developmental Abnormalities: Skin and skin appendages.

Species: Mouse

Dose: 750 MG/KG

Route of Application: Unreported

Exposure Time: (9-11D PREG)

Result: Specific Developmental Abnormalities: Other developmental abnormalities.

CHRONIC EXPOSURE - MUTAGEN

Species: Human

Dose: 112 GM/L

Cell Type: Other cell types

Mutation test: DNA damage

Species: Human
Dose: 1400 MG/KG
Cell Type: S. typhimurium
Mutation test: Body fluid assay

Species: Rat
Route: Intraperitoneal
Dose: 56 MG/KG
Mutation test: DNA damage

Species: Rat
Dose: 112 GM/L
Cell Type: liver
Mutation test: DNA damage

Species: Rat
Dose: 500 MG/KG
Cell Type: S. cerevisiac
Mutation test: Body fluid assay

Species: Rat
Dose: 1 GM/KG
Exposure Time: 4D
Cell Type: S. typhimurium
Mutation test: Body fluid assay

Species: Rat
Dose: 500 MG/KG
Cell Type: S. cerevisiac
Mutation test: Host-mediated assay

Species: Rat
Route: Unreported
Dose: 16 MG/KG
Exposure Time: 8D
Mutation test: sperm

Species: Mouse
Route: Intraperitoneal
Dose: 64 MG/KG
Mutation test: DNA damage

Species: Mouse
Dose: 430 UMOL/L
Cell Type: Other cell types
Mutation test: DNA damage

Species: Mouse
Dose: 50 MG/L
Cell Type: Other cell types
Mutation test: DNA inhibition

Species: Mouse
Route: Intraperitoneal
Dose: 64 MG/KG
Mutation test: Sister chromatid exchange

Species: Mouse
Dose: 100 MG/L
Cell Type: lymphocyte
Mutation test: Mutation in mammalian somatic cells.

Species: Hamster
Dose: 200 MG/L (+S9)
Cell Type: ovary
Mutation test: Mutation in microorganisms

Species: Hamster
Dose: 900 MG/L
Cell Type: ovary
Mutation test: Cytogenetic analysis

Species: Hamster
Dose: 100 MG/L
Cell Type: lung
Mutation test: Cytogenetic analysis

Species: Hamster
Dose: 60 MG/L
Cell Type: fibroblast
Mutation test: Cytogenetic analysis

Species: Hamster
Dose: 33 MG/L
Cell Type: ovary
Mutation test: Sister chromatid exchange

Species: Hamster
Dose: 200 MG/L
Cell Type: ovary
Mutation test: Mutation in mammalian somatic cells.

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Man
Dose: 140 MG/KG
Route of Application: Oral
Exposure Time: (14D MALE)
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count).

Species: Rat
Dose: 2100 MG/KG
Route of Application: Oral
Exposure Time: (14D MALE)
Result: Paternal Effects: Testes, epididymis, sperm duct.
Paternal Effects: Other effects on male.

Species: Rat
Dose: 1740 MG/KG
Route of Application: Oral
Exposure Time: (8W MALE/2W PRE-2W PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Rat
Dose: 1920 MG/KG
Route of Application: Oral
Exposure Time: (8W MALE/2W PRE-3W PREG)
Result: Effects on Newborn: Growth statistics (e.g., reduced weight gain). Effects on Newborn: Viability index (e.g., # alive at day 4 per # born alive).

Species: Mouse

Dose: 105 GM/KG
Route of Application: Oral
Exposure Time: (43W PRE)
Result: Maternal Effects: Ovaries, fallopian tubes.

Species: Mouse
Dose: 87500 UG/KG
Route of Application: Oral
Exposure Time: (5D MALE)
Result: Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea).

Section 12 - Ecological Information

No data available.

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

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.

Section 14 - Transport 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.

Section 15 - Regulatory Information

EU ADDITIONAL CLASSIFICATION

Symbol of Danger: Xn
Indication of Danger: Harmful.
R: 22-42/43
Risk Statements: Harmful if swallowed. May cause sensitization by inhalation and skin contact.
S: 22-36/37-45
Safety Statements: Do not breathe dust. Wear suitable protective clothing and gloves. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Harmful.
Risk Statements: May cause sensitization by inhalation and skin contact. Harmful if swallowed.
Safety Statements: Do not breathe dust. Wear suitable protective clothing and gloves. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
US Statements: Target organ(s): Liver. Nerves. Calif. Prop. 65 developmental hazard.

UNITED STATES REGULATORY INFORMATION

SARA LISTED: No

TSCA INVENTORY ITEM: Yes

UNITED STATES - STATE REGULATORY INFORMATION

CALIFORNIA PROP - 65

California Prop - 65: This product is or contains chemical(s) known to the state of California to cause male developmental toxicity. This product is or contains chemical(s) known to the state of California to cause male developmental toxicity.

CANADA REGULATORY INFORMATION

WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

DSL: No

NDSL: Yes

Section 16 - Other Information

DISCLAIMER

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

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 2008 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.