Section 1 - Product and Company Information

Product Name                       5-BROMO-2'-DEOXYURIDINE
Product Number                     B5002
Brand                              SIGMA
Company                            Sigma-Aldrich
Street Address                     3050 Spruce Street
City, State, Zip, Country          SAINT LOUIS MO 63103 US
Technical Phone:                   314 771 5765
Emergency Phone:                   414 273 3850 Ext. 5996
Fax:                               800 325 5052

Section 2 - Composition/Information on Ingredient

<table>
<thead>
<tr>
<th>Substance Name</th>
<th>CAS #</th>
<th>SARA 313</th>
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<tbody>
<tr>
<td>(+)-5-BROMO-2'-DEOXYURIDINE</td>
<td>59-14-3</td>
<td>No</td>
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Formula         C9H11BrN2O5
Synonyms        BDU * 5-Bdu * Bromodeoxyuridine *
                5-Bromodeoxyuridine * 5-Bromodesoxyuridine *
                5-Bromo-2'-deoxyuridine * Bromouracil
deoxyriboside * 5-Bromouracil deoxyriboside *
                5-Bromouracil-2-deoxyriboside * Broxuridine *
                Brudr * BUDR * 5-Budr

RTECS Number:   YU7350000

Section 3 - Hazards Identification

EMERGENCY OVERVIEW
Caution: Avoid contact and inhalation. Target organ(s): Immune system.

HMIS RATING
HEALTH: 1*
FLAMMABILITY: 0
REACTIVITY: 0

NFPA RATING
HEALTH: 1
FLAMMABILITY: 0
REACTIVITY: 0

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

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)
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.

Section 7 - Handling and Storage

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

STORAGE
Suitable: Keep tightly closed.
Store at -20°C

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS
Safety shower and eye bath. Mechanical exhaust required.

PERSONAL PROTECTIVE EQUIPMENT
Respiratory: Wear dust mask.
Hand: Protective gloves.
Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES
Wash thoroughly after handling.

Section 9 - Physical/Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>At Temperature or Pressure</th>
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</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Physical State: Solid</td>
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<tr>
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<td>Form: Powder</td>
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<td>Molecular Weight</td>
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<td>Freezing Point</td>
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<td>Vapor Pressure</td>
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<td>Miscellaneous Data</td>
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<tr>
<td>Solubility</td>
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</table>

N/A = not available

Section 10 - Stability and Reactivity

STABILITY
Stable: Stable.
Materials to Avoid: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS

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: May be harmful if swallowed.

TARGET ORGAN(S) OR SYSTEM(S)
Immune 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
8400 mg/kg
LD50

Intraperitoneal
Rat
1500 MG/KG
LD50

Subcutaneous
Rat
3900 MG/KG
LD50

Intravenous
Rat
2320 MG/KG
LD50
Remarks: Vascular: Other changes.

Oral
Mouse
9100 mg/kg
LD50

Intraperitoneal
Mouse
3050 MG/KG
LD50

Subcutaneous
Mouse
3500 MG/KG
LD50
Intravenous
Mouse
2500 MG/KG
LD50
Cardiac: Pulse rate. Lungs, Thorax, or Respiration: Respiratory depression.

Oral
Quail
> 100 mg/kg
LD50

CHRONIC EXPOSURE - CARCINOGEN

Species: Rat
Route of Application: Subcutaneous
Dose: 16 MG/KG
Result: Endocrine: Thyroid tumors. Tumorigenic Effects:
Testicular tumors. Tumorigenic: Carcinogenic by RTECS criteria.

CHRONIC EXPOSURE - TERATOGEN
Result: Laboratory experiments have shown teratogenic effects.

Species: Rat
Dose: 250 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (13D PREG)
Result: Effects on Embryo or Fetus: Cytological changes (including somatic cell genetic material).

Species: Rat
Dose: 200 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (13D PREG)
Result: Specific Developmental Abnormalities: Musculoskeletal system. Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Mouse
Dose: 500 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (11D PREG)
Result: Specific Developmental Abnormalities: Respiratory system. Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Mouse
Dose: 300 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (10D PREG)
Result: Specific Developmental Abnormalities: Musculoskeletal system. Specific Developmental Abnormalities: Craniofacial (including nose and tongue).

Species: Mouse
Dose: 200 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (8D PREG)
Result: Specific Developmental Abnormalities: Eye, ear. Specific Developmental Abnormalities: Central nervous system.
Species: Mouse
Dose: 200 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (11D PREG)
Result: Specific Developmental Abnormalities: Musculoskeletal system. Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Mouse
Dose: 40 MG/KG
Route of Application: Intravenous
Exposure Time: (6D PREG)
Result: Effects on Embryo or Fetus: Other effects to embryo.

Species: Mouse
Dose: 300 MG/KG 300 MG/KG
Route of Application: Parenteral Parenteral
Exposure Time: (8D PREG) (8D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Mouse
Dose: 600 MG/KG
Route of Application: Parenteral
Exposure Time: (9D PREG)
Result: Specific Developmental Abnormalities: Eye, ear. Specific Developmental Abnormalities: Musculoskeletal system.

Species: Mouse
Dose: 1 GM/KG
Route of Application: Parenteral
Exposure Time: (10D PREG)
Result: Specific Developmental Abnormalities: Craniofacial (including nose and tongue).

Species: Mouse
Dose: 500 MG/KG
Route of Application: Unreported
Exposure Time: (11D PREG)
Result: Specific Developmental Abnormalities: Craniofacial (including nose and tongue). Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Hamster
Dose: 400 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (8D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Hamster
Dose: 400 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (10D PREG)
Result: Specific Developmental Abnormalities: Musculoskeletal system. Specific Developmental Abnormalities: Craniofacial (including nose and tongue).
Route of Application: Intraperitoneal
Exposure Time: (9D PREG)
Result: Effects on Embryo or Fetus: Cytological changes
(including somatic cell genetic material). Specific Developmental Abnormalities: Craniofacial (including nose and tongue).

Species: Hamster
Dose: 400 MG/KG

Route of Application: Intravenous
Exposure Time: (8D PREG)
Result: Effects on Embryo or Fetus: Fetal death.

Species: Hamster
Dose: 400 MG/KG

Route of Application: Intravenous
Exposure Time: (8D PREG)

CHRONIC EXPOSURE - MUTAGEN
Result: Laboratory experiments have shown mutagenic effects.

Species: Human
Dose: 82 UMOL/L
Cell Type: fibroblast
Mutation test: Micronucleus test

Species: Human
Dose: 10 UMOL/L
Cell Type: fibroblast
Mutation test: DNA damage

Species: Human
Dose: 1 MMOL/L
Cell Type: HeLa cell
Mutation test: DNA inhibition

Species: Human
Dose: 82 UMOL/L
Cell Type: fibroblast
Mutation test: Cytogenetic analysis

Species: Human
Dose: 200 MG/L
Cell Type: leukocyte
Mutation test: Cytogenetic analysis

Species: Human
Dose: 13 MG/L
Cell Type: lymphocyte
Mutation test: Cytogenetic analysis

Species: Human
Dose: 15 MG/L
Cell Type: lymphocyte
Mutation test: Sister chromatid exchange

Species: Human
Dose: 20 UMOL/L
Cell Type: lymphocyte
Mutation test: Sister chromatid exchange

Species: Human
Dose: 10 MG/L
Cell Type: leukocyte
Mutation test: Sister chromatid exchange

Species: Human
Dose: 10 MG/L
Cell Type: fibroblast
Mutation test: Sister chromatid exchange

Species: Human
Dose: 20 MG/L
Cell Type: ovary
Mutation test: Sister chromatid exchange

Species: Human
Dose: 15 MG/L
Cell Type: Other cell types
Mutation test: Sister chromatid exchange

Species: Human
Dose: 15 MG/L
Cell Type: testis
Mutation test: Sister chromatid exchange

Species: Human
Dose: 15 MG/L
Cell Type: fibroblast
Mutation test: Mutation in mammalian somatic cells.

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

Species: Human
Dose: 10 UMOL/L
Cell Type: Other cell types
Mutation test: Sister chromatid exchange

Species: Human
Dose: 10 UMOL/L
Cell Type: ovary
Mutation test: Sister chromatid exchange

Species: Rat
Dose: 100 UMOL/L
Cell Type: Embryo
Mutation test: DNA damage

Species: Rat
Dose: 1 UMOL/L
Cell Type: Other cell types
Mutation test: DNA damage

Species: Rat
Route: Subcutaneous
Dose: 1087 MG/KG
Mutation test: DNA inhibition
Species: Rat
Dose: 1 UMOL/L
Cell Type: lymphocyte
Mutation test: Other mutation test systems

Species: Rat
Dose: 25 UMOL/L
Cell Type: lymphocyte
Mutation test: Cytogenetic analysis

Species: Rat
Route: Intravenous
Dose: 80 MG/KG
Exposure Time: 24H
Mutation test: Sister chromatid exchange

Species: Rat
Dose: 1 UMOL/L
Cell Type: lymphocyte
Mutation test: Sister chromatid exchange

Species: Rat
Route: Subcutaneous
Dose: 1087 MG/KG
Mutation test: Mutation in mammalian somatic cells.

Species: Rat
Dose: 5 MG/L
Cell Type: Other cell types
Mutation test: Mutation in mammalian somatic cells.

Species: Rat
Route: Subcutaneous
Dose: 150 MG/KG
Mutation test: sperm

Species: Mouse
Route: Intraperitoneal
Dose: 500 MG/KG
Mutation test: Micronucleus test

Species: Mouse
Dose: 10 UMOL/L
Cell Type: lymphocyte
Mutation test: DNA damage

Species: Mouse
Dose: 72 UMOL/L
Cell Type: fibroblast
Mutation test: DNA damage

Species: Hamster
Dose: 20 UMOL/L
Cell Type: kidney
Mutation test: Cytogenetic analysis

Species: Mouse
Dose: 90 UMOL/L
Cell Type: fibroblast
Mutation test: Cytogenetic analysis

Species: Mouse
Route: Intraperitoneal  
Dose: 20 MG/KG  
Mutation test: Cytogenetic analysis

Species: Mouse  
Dose: 50 MG/L  
Cell Type: Embryo  
Mutation test: Cytogenetic analysis

Species: Mouse  
Dose: 10 MG/L  
Exposure Time: 4W  
Cell Type: lymphocyte  
Mutation test: Cytogenetic analysis

Species: Mouse  
Dose: 5 MG/L  
Cell Type: Ascites tumor  
Mutation test: Cytogenetic analysis

Species: Mouse  
Route: Subcutaneous  
Dose: 1200 MG/KG  
Mutation test: Sister chromatid exchange

Species: Mouse  
Route: Implant  
Dose: 220 MG/KG  
Mutation test: Sister chromatid exchange

Species: Mouse  
Route: Intraperitoneal  
Dose: 200 MG/KG  
Mutation test: Sister chromatid exchange

Species: Mouse  
Dose: 1 UMOL/L  
Cell Type: Other cell types  
Mutation test: Sister chromatid exchange

Species: Mouse  
Dose: 10 MG/L  
Cell Type: lung  
Mutation test: Sister chromatid exchange

Species: Mouse  
Dose: 10 MG/L  
Cell Type: testis  
Mutation test: Sister chromatid exchange

Species: Mouse  
Dose: 10 UMOL/L  
Cell Type: Other cell types  
Mutation test: Sister chromatid exchange

Species: Mouse  
Dose: 1 NMOL/L  
Cell Type: Embryo  
Mutation test: Sister chromatid exchange

Species: Mouse  
Dose: 1250 NMOL/L
Cell Type: Embryo
Mutation test: Mutation in mammalian somatic cells.

Species: Mouse
Route: Parenteral
Dose: 10 GM/KG
Mutation test: sperm

Species: Mouse
Route: Intraperitoneal
Dose: 200 MG/KG
Mutation test: sperm

Species: Mouse
Route: Intraperitoneal
Dose: 50 MG/KG
Mutation test: Heritable translocation test

Species: Hamster
Dose: 5 UMOL/L
Cell Type: ovary
Mutation test: Micronucleus test

Species: Hamster
Dose: 50 UMOL/L
Cell Type: ovary
Mutation test: specific locus test

Species: Hamster
Dose: 1560 UG/L
Cell Type: Embryo
Mutation test: Morphological transformation.

Species: Hamster
Dose: 10 UMOL/L
Cell Type: ovary
Mutation test: DNA damage

Species: Hamster
Dose: 50 UMOL/L
Cell Type: ovary
Mutation test: Cytogenetic analysis

Species: Hamster
Dose: 25 MG/L
Exposure Time: 28H
Cell Type: Other cell types
Mutation test: Cytogenetic analysis

Species: Hamster
Dose: 25 MG/L
Cell Type: fibroblast
Mutation test: Cytogenetic analysis

Species: Hamster
Dose: 100 MG/L
Cell Type: Other cell types
Mutation test: Cytogenetic analysis

Species: Hamster
Dose: 10 UMOL/L
Cell Type: ovary
Mutation test: Sister chromatid exchange

Species: Hamster
Dose: 40 MG/L
Cell Type: Other cell types
Mutation test: Sister chromatid exchange

Species: Hamster
Dose: 100 UMOL/L
Cell Type: fibroblast
Mutation test: Sister chromatid exchange

Species: Hamster
Route: Intraperitoneal
Dose: 28800 UG/KG
Mutation test: Sister chromatid exchange

Species: Hamster
Dose: 10 MMOL/L
Exposure Time: 1H
Cell Type: lung
Mutation test: Mutation in mammalian somatic cells.

Species: Hamster
Dose: 300 UMOL/L
Cell Type: ovary
Mutation test: Mutation in mammalian somatic cells.

Species: Hamster
Dose: 5 MG/L
Cell Type: Other cell types
Mutation test: Mutation in mammalian somatic cells.

Species: Hamster
Dose: 10 MG/L
Cell Type: kidney
Mutation test: Mutation in mammalian somatic cells.

Species: Hamster
Dose: 5 MG/L
Cell Type: fibroblast
Mutation test: Mutation in mammalian somatic cells.

Species: Hamster
Dose: 30 UMOL/L
Cell Type: Other cell types
Mutation test: Mutation in mammalian somatic cells.

Species: Hamster
Route: Parenteral
Dose: 80 UG/KG
Mutation test: sperm

Species: Hamster
Dose: 10 UMOL/L
Cell Type: ovary
Mutation test: Heritable translocation test

Species: Monkey
Dose: 30 UMOL/L
Cell Type: lymphocyte
Mutation test: Sister chromatid exchange
Species: Chicken
Dose: 500 UG/L
Cell Type: Embryo
Mutation test: DNA

Species: Cattle, Horse
Dose: 20 MG/L
Cell Type: lymphocyte
Mutation test: Cytogenetic analysis

Species: Mammal
Dose: 50 MG/L
Cell Type: lymphocyte
Mutation test: Cytogenetic analysis

Species: Chicken
Route: Parenteral
Dose: 8475 UG/KG
Mutation test: Sister chromatid exchange

Species: Cattle, Horse
Dose: 2 MG/L
Cell Type: lymphocyte
Mutation test: Sister chromatid exchange

Species: Pig
Dose: 2 MG/L
Cell Type: lymphocyte
Mutation test: Sister chromatid exchange

Species: Domestic Animals
Dose: 2 MG/L
Cell Type: lymphocyte
Mutation test: Sister chromatid exchange

Species: Mammal
Route: Subcutaneous
Dose: 1 GM/KG
Mutation test: Sister chromatid exchange

Species: Mammal
Dose: 30 UMOL/L
Cell Type: lymphocyte
Mutation test: Sister chromatid exchange

Species: Mammal
Dose: 100 UMOL/L
Cell Type: fibroblast
Mutation test: Sister chromatid exchange

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD
Result: Overexposure may cause reproductive disorder(s) based on tests with laboratory animals.

Species: Rat
Dose: 700 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (9-15D PREG)
Result: Effects on Newborn: Weaning or lactation index (e.g., # alive at weaning per # alive at day 4). Effects on Newborn: Growth statistics (e.g., reduced weight gain).
Species: Mouse
Dose: 600 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (8-13D PREG)
Result: Effects on Newborn: Delayed effects.

Species: Mouse
Dose: 400 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (9D PREG)
Result: Effects on Newborn: Growth statistics (e.g., reduced weight gain).

Species: Mouse
Dose: 400 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (8D PREG)
Result: Effects on Newborn: Viability index (e.g., # alive at day 4 per # born alive).

Species: Mouse
Dose: 1200 MG/KG
Route of Application: Parenteral
Exposure Time: (9D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).
Effects on Embryo or Fetus: Cytological changes (including somatic cell genetic material).

Species: Mouse
Dose: 1 GM/KG
Route of Application: Parenteral
Exposure Time: (7D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Hamster
Dose: 640 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (8D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Hamster
Dose: 400 MG/KG
Route of Application: Intravenous
Exposure Time: (8D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

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

US CLASSIFICATION AND LABEL TEXT
US Statements: Caution: Avoid contact and inhalation. Target organ(s): Immune system.

UNITED STATES REGULATORY INFORMATION
SARA LISTED: No
TSCA INVENTORY ITEM: Yes

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: Yes
NDSL: No

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.
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