

1 Identification

Product identifier

Product name: 5-Fluorouracil

Stock number: L02004

CAS Number:

51-21-8

EC number:

200-085-6

Relevant identified uses of the substance or mixture and uses advised against.

Identified use: SU24 Scientific research and development

Details of the supplier of the safety data sheet

Manufacturer/Supplier:

Alfa Aesar

Thermo Fisher Scientific Chemicals, Inc.

30 Bond Street

Ward Hill, MA 01835-8099

Tel: 800-343-0660

Fax: 800-322-4757

Email: tech@alfa.com

www.alfa.com

Information Department: Health, Safety and Environmental Department

Emergency telephone number:

During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660. After normal business hours, call Carechem 24 at (866) 928-0789.

2 Hazard(s) identification

Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)



GHS08 Health hazard

Muta. 2 H341 Suspected of causing genetic defects.

Repr. 1A H360 May damage fertility or the unborn child.

STOT RE 2 H373 May cause damage to the kidneys, the liver, the heart, the digestive system, the blood and the endocrine system through prolonged or repeated exposure. Route of exposure: Oral.



GHS07

Acute Tox. 4 H302 Harmful if swallowed.

Hazards not otherwise classified No information known.

Label elements

GHS label elements The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)

Hazard pictograms



GHS07 GHS08

Signal word

Danger

Hazard statements

H302 Harmful if swallowed.

H341 Suspected of causing genetic defects.

H360 May damage fertility or the unborn child.

H373 May cause damage to the kidneys, the liver, the heart, the digestive system, the blood and the endocrine system through prolonged or repeated exposure.

Route of exposure: Oral.

Precautionary statements

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P281 Use personal protective equipment as required.

P301+P312 IF SWALLOWED: Call a POISON CENTER/doctor/.../if you feel unwell.

P308+P313 IF exposed or concerned: Get medical advice/attention.

P405 Store locked up.

P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

WHMIS classification

D1B - Toxic material causing immediate and serious toxic effects

D2A - Very toxic material causing other toxic effects



Classification system

HMIS ratings (scale 0-4)

(Hazardous Materials Identification System)

HEALTH 2 Health (acute effects) = 2

FIRE 1 Flammability = 1

REACTIVITY 1 Physical Hazard = 1

Other hazards

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

3 Composition/information on ingredients

Chemical characterization: Substances

CAS# Description:

51-21-8 5-Fluorouracil

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|---|--------------------|
| Product name: 5-Fluorouracil | |
| Identification number(s): EC number: 200-085-6 | (Contd. of page 1) |
| 4 First-aid measures Description of first aid measures After inhalation Supply fresh air. If required, provide artificial respiration. Keep patient warm. Seek immediate medical advice. After skin contact Immediately wash with water and soap and rinse thoroughly. Seek immediate medical advice. After eye contact Rinse opened eye for several minutes under running water. Then consult a doctor. After swallowing Seek medical treatment. Information for doctor Most important symptoms and effects, both acute and delayed No further relevant information available. Indication of any immediate medical attention and special treatment needed No further relevant information available. | |
| 5 Fire-fighting measures Extinguishing media Suitable extinguishing agents Carbon dioxide, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam. Special hazards arising from the substance or mixture If this product is involved in a fire, the following can be released: Carbon monoxide and carbon dioxide Nitrogen oxides (NOx) Hydrogen fluoride (HF) Advice for firefighters Protective equipment: Wear self-contained respirator. Wear fully protective impervious suit. | |
| 6 Accidental release measures Personal precautions, protective equipment and emergency procedures Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation Environmental precautions: Do not allow material to be released to the environment without proper governmental permits. Methods and material for containment and cleaning up: Dispose of contaminated material as waste according to section 13. Prevention of secondary hazards: No special measures required. Reference to other sections See Section 7 for information on safe handling See Section 8 for information on personal protection equipment. See Section 13 for disposal information. | |
| 7 Handling and storage Handling Precautions for safe handling Keep container tightly sealed. Store in cool, dry place in tightly closed containers. Ensure good ventilation at the workplace. Open and handle container with care. Information about protection against explosions and fires: No information known. Conditions for safe storage, including any incompatibilities Storage Requirements to be met by storerooms and receptacles: No special requirements. Information about storage in one common storage facility: Store away from oxidizing agents. Further information about storage conditions: Keep container tightly sealed. Store in cool, dry conditions in well sealed containers. Specific end use(s) No further relevant information available. | |
| 8 Exposure controls/personal protection Additional information about design of technical systems: Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute. Control parameters Components with limit values that require monitoring at the workplace: Not required. Additional information: No data Exposure controls Personal protective equipment General protective and hygienic measures The usual precautionary measures for handling chemicals should be followed. Keep away from foodstuffs, beverages and feed. Remove all soiled and contaminated clothing immediately. Wash hands before breaks and at the end of work. Store protective clothing separately. Maintain an ergonomically appropriate working environment. Breathing equipment: Use suitable respirator when high concentrations are present. Protection of hands: Impervious gloves Check protective gloves prior to each use for their proper condition. The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer. Penetration time of glove material (in minutes) Not determined Eye protection: Safety glasses Body protection: Protective work clothing. | |
| USA (Contd. on page 3) | |

Product name: 5-Fluorouracil

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9 Physical and chemical properties

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| Information on basic physical and chemical properties | |
| General Information | |
| Appearance: | |
| Form: | Crystalline powder |
| Color: | White |
| Odor: | Not determined |
| Odor threshold: | Not determined. |
| pH-value: | |
| Not applicable. | |
| Change in condition | |
| Melting point/Melting range: | 282 °C (540 °F) (decomposes) |
| Boiling point/Boiling range: | Not determined |
| Sublimation temperature / start: | Not determined |
| Flash point: | |
| Not applicable | |
| Flammability (solid, gaseous) | |
| Not determined. | |
| Ignition temperature: | |
| Not determined | |
| Decomposition temperature: | |
| Not determined | |
| Auto igniting: | |
| Not determined. | |
| Danger of explosion: | |
| Product does not present an explosion hazard. | |
| Explosion limits: | |
| Lower: | |
| Not determined | |
| Upper: | |
| Not determined | |
| Vapor pressure: | |
| Not applicable. | |
| Density: | |
| Not determined | |
| Relative density | |
| Not determined. | |
| Vapor density | |
| Not applicable. | |
| Evaporation rate | |
| Not applicable. | |
| Solubility in / Miscibility with | |
| Water at 20 °C (68 °F): | |
| 12 g/l | |
| Partition coefficient (n-octanol/water): | |
| Not determined. | |
| Viscosity: | |
| dynamic: | |
| Not applicable. | |
| kinematic: | |
| Not applicable. | |
| Other information | |
| No further relevant information available. | |

10 Stability and reactivity

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| Reactivity No information known. | |
| Chemical stability Stable under recommended storage conditions. | |
| Thermal decomposition / conditions to be avoided: Decomposition will not occur if used and stored according to specifications. | |
| Possibility of hazardous reactions No dangerous reactions known | |
| Conditions to avoid No further relevant information available. | |
| Incompatible materials: Oxidizing agents | |
| Hazardous decomposition products: | |
| Carbon monoxide and carbon dioxide | |
| Nitrogen oxides | |
| Hydrogen fluoride | |

11 Toxicological information

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| Information on toxicological effects | |
| Acute toxicity: | |
| Harmful if swallowed. | |
| The Registry of Toxic Effects of Chemical Substances (RTECS) contains acute toxicity data for this substance. | |
| LD/LC50 values that are relevant for classification: No data | |
| Skin irritation or corrosion: May cause irritation | |
| Eye irritation or corrosion: May cause irritation | |
| Sensitization: No sensitizing effects known. | |
| Germ cell mutagenicity: | |
| Suspected of causing genetic defects. | |
| The Registry of Toxic Effects of Chemical Substances (RTECS) contains mutation data for this substance. | |
| Carcinogenicity: | |
| IARC-3: Not classifiable as to carcinogenicity to humans. | |
| The Registry of Toxic Effects of Chemical Substances (RTECS) contains tumorigenic and/or carcinogenic and/or neoplastic data for this substance. | |
| Reproductive toxicity: | |
| May damage fertility or the unborn child. | |
| The Registry of Toxic Effects of Chemical Substances (RTECS) contains reproductive data for this substance. | |
| Specific target organ system toxicity - repeated exposure: | |
| May cause damage to the kidneys, the liver, the heart, the digestive system, the blood and the endocrine system through prolonged or repeated exposure. Route of exposure: Oral. | |
| Specific target organ system toxicity - single exposure: No effects known. | |
| Aspiration hazard: No effects known. | |
| Other information (about experimental toxicology): | |
| Tumorigenic effects have been observed on tests with laboratory animals. | |
| Reproductive effects have been observed on tests with laboratory animals. | |
| Reproductive effects have been observed in humans. | |
| Mutagenic effects have been observed on tests with bacteria. | |
| Mutagenic effects have been observed on tests with insects. | |
| Mutagenic effects have been observed on tests with human and/or animal DNA cells. | |
| Mutagenic effects have been observed on tests with laboratory animals. | |
| Subacute to chronic toxicity: | |
| The Registry of Toxic Effects of Chemical Substances (RTECS) reports the following effects in laboratory animals: | |
| Behavioral - muscle weakness. | |
| Behavioral - fluid intake. | |
| Behavioral - convulsions or effect on seizure threshold. | |
| Behavioral - ataxia. | |
| Behavioral - antipsychotic. | |
| Gastrointestinal - other changes. | |
| Gastrointestinal - hypermotility, diarrhea. | |
| Gastrointestinal - nausea or vomiting. | |
| Blood - changes in bone marrow (not otherwise specified). | |
| Blood - other hemolysis with or without anemia. | |

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USA

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Blood - normocytic anemia.
Blood - changes in leukocyte (WBC) count.
Blood - changes in platelet count.
Blood - changes in erythrocyte (RBC) count.
Blood - changes in serum composition (e.g. TP, bilirubin, cholesterol).
Blood - tumors.
Cardiac - EKG changes not diagnostic of specified effects.
Cardiac - other changes.
Cardiac - changes in coronary arteries.
Liver - changes in liver weight.
Vascular - BP elevation not characterized in autonomic section.
Skin and Appendages - dermatitis, other (after systemic exposure).
Lungs, Thorax, or Respiration - other changes.
Lungs, Thorax, or Respiration - tumors.
Peripheral Nerve and Sensation - sensory change involving peripheral nerve.
Nutritional and Gross Metabolic - weight loss or decreased weight gain.
Sense Organs and Special Senses (Eye) - ptosis.
Sense Organs and Special Senses (Eye) - effect, not otherwise specified.
Endocrine - changes in spleen weight.
Endocrine - changes in thymus weight.
Related to Chronic Data - changes in testicular weight.
Related to Chronic Data - death.
Kidney, Ureter, Bladder - changes in bladder weight.
Skin and Appendages - tumors.
Biochemical - Enzyme inhibition, induction, or change in blood or tissue levels - transaminases.
Reproductive - Effects on Newborn - other neonatal measures or effects.
Reproductive - Specific Developmental Abnormalities - musculoskeletal system.
Reproductive - Fertility - litter size (e.g. # fetuses per litter; measured before birth).
Reproductive - Effects on Embryo or Fetus - fetotoxicity (except death, e.g., stunted fetus).
Reproductive - Effects on Embryo or Fetus - fetal death.
Reproductive - Fertility - post-implantation mortality (e.g. dead/or resorbed implants per total number of implants).
Reproductive - Specific Developmental Abnormalities - other developmental abnormalities.
Reproductive - Specific Developmental Abnormalities - craniofacial (including nose and tongue).
Reproductive - Specific Developmental Abnormalities - gastrointestinal system.
Reproductive - Specific Developmental Abnormalities - homeostasis.
Reproductive - Effects on Embryo or Fetus - cytological changes (including somatic cell genetic material)
Reproductive - Fertility - abortion.
Reproductive - Specific Developmental Abnormalities - eye/ear.
Reproductive - Effects on Newborn - live birth index (measured after birth)
Reproductive - Effects on Newborn - viability index (e.g., # alive at day 4 per # born live).
Reproductive - Effects on Newborn - growth statistics (e.g.%, reduced weight gain).
Reproductive - Paternal Effects - spermatogenesis (including genetic material, sperm morphology, motility, and count).
Tumorigenic - active as anti-cancer agent.
Tumorigenic - protects against induction of experimental tumors.
Tumorigenic - carcinogenic by RTECS criteria.
The Registry of Toxic Effects of Chemical Substances (RTECS) contains multiple dose toxicity data for this substance.
Additional toxicological information:
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
Product is suspected to cause birth defects.


12 Ecological information

Toxicity
Aquatic toxicity: No further relevant information available.
Persistence and degradability No further relevant information available.
Bioaccumulative potential No further relevant information available.
Mobility in soil No further relevant information available.
Additional ecological information:
General notes:
Do not allow product to reach ground water, water course or sewage system.
Do not allow material to be released to the environment without proper governmental permits.
Do not allow product to reach ground water, water course or sewage system, even in small quantities.
Danger to drinking water if even extremely small quantities leak into the ground.
Avoid transfer into the environment.
Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.
Other adverse effects No further relevant information available.


13 Disposal considerations



Waste treatment methods
Recommendation Consult state, local or national regulations to ensure proper disposal.
Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.

14 Transport information

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| UN-Number DOT, IMDG, IATA | UN2811 |
| UN proper shipping name DOT IMDG, IATA | Toxic solids, organic, n.o.s. (5-Fluorouracil) TOXIC SOLID, ORGANIC, N.O.S. (5-Fluorouracil) |
| Transport hazard class(es) DOT | |
|  | |
| Class Label Class | 6.1 Toxic substances. 6.1 6.1 (T2) Toxic substances |

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USA

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| Product name: 5-Fluorouracil | |
| (Contd. of page 4) | |
| Label IMDG, IATA  | 6.1 |
| Class Label | 6.1 Toxic substances. 6.1 |
| Packing group DOT, IMDG, IATA | III |
| Environmental hazards: | Not applicable. |
| Special precautions for user | Warning: Toxic substances |
| Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code | Not applicable. |
| Transport/Additional information: | |
| DOT Marine Pollutant (DOT): | No |
| UN "Model Regulation": | UN2811, Toxic solids, organic, n.o.s. (5-Fluorouracil), 6.1, III |

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| 15 Regulatory information | |
| Safety, health and environmental regulations/legislation specific for the substance or mixture GHS label elements The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS) Hazard pictograms   | |
| GHS07 GHS08 | |
| Signal word Danger Hazard statements H302 Harmful if swallowed. H341 Suspected of causing genetic defects. H360 May damage fertility or the unborn child. H373 May cause damage to the kidneys, the liver, the heart, the digestive system, the blood and the endocrine system through prolonged or repeated exposure. Route of exposure: Oral. | |
| Precautionary statements P260 Do not breathe dust/fume/gas/mist/vapours/spray. P281 Use personal protective equipment as required. P301+P312 IF SWALLOWED: Call a POISON CENTER/doctor/...if you feel unwell. P308+P313 IF exposed or concerned: Get medical advice/attention. P405 Store locked up. P501 Dispose of contents/container in accordance with local/regional/national/international regulations. | |
| National regulations All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory. All components of this product are listed on the Canadian Non-Domestic Substances List (NDSL). | |
| SARA Section 313 (specific toxic chemical listings) 51-21-8 5-Fluorouracil | |
| California Proposition 65 Prop 65 - Chemicals known to cause cancer Substance is not listed. | |
| Prop 65 - Developmental toxicity 51-21-8 5-Fluorouracil | |
| Prop 65 - Developmental toxicity, female Substance is not listed. Prop 65 - Developmental toxicity, male Substance is not listed. Information about limitation of use: For use only by technically qualified individuals. This product is subject to the reporting requirements of section 313 of the Emergency Planning and Community Right to Know Act of 1986 and 40CFR372. Other regulations, limitations and prohibitive regulations Although this chemical may sometimes be used as a food or drug or cosmetic, our products are not approved or suitable for such use or for human consumption. Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006. Substance is not listed. The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed. Substance is not listed. Annex XIV of the REACH Regulations (requiring Authorisation for use) Substance is not listed. Chemical safety assessment: A Chemical Safety Assessment has not been carried out. | |

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| 16 Other information | |
| Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user. | |
| Department issuing SDS: Global Marketing Department Date of preparation / last revision 11/23/2015 / - Abbreviations and acronyms: RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail) IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA) ICAO: International Civil Aviation Organization ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO) ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road) IMDG: International Maritime Code for Dangerous Goods DOT: US Department of Transportation IATA: International Air Transport Association EINECS: European Inventory of Existing Commercial Chemical Substances CAS: Chemical Abstracts Service (division of the American Chemical Society) HMIS: Hazardous Materials Identification System (USA) WHMIS: Workplace Hazardous Materials Information System (Canada) LC50: Lethal concentration, 50 percent LD50: Lethal dose, 50 percent vPvB: very Persistent and very Bioaccumulative ACGIH: American Conference of Governmental Industrial Hygienists (USA) OSHA: Occupational Safety and Health Administration (USA) NTP: National Toxicology Program (USA) IARC: International Agency for Research on Cancer EPA: Environmental Protection Agency (USA) | |