



# SAFETY DATA SHEET

## 1. Identification

Product identifier	Furosemide		
Other means of identification			
Catalog number	1287008		
Chemical name	Benzoic acid, 5-(aminosulfonyl)-4-chloro-2-[(2-furanylmethyl)amino]-		
Synonym(s)	Frusemide		
Recommended use	Specified quality tests and assay use only.		
Recommended restrictions	Not for use as a drug. Not for administration to humans or animals.		
Manufacturer/Importer/Supplier/Distributor information			
Company name	U. S. Pharmacopeia		
Address	12601 Twinbrook Parkway Rockville MD 20852-1790 US		
Telephone	RS Technical Services	301-816-8129	
Website	www.usp.org		
E-mail	RSTECH@usp.org		
Emergency phone number	CHEMTREC within US & Canada	1-800-424-9300	
	CHEMTREC outside US & Canada	+1 703-527-3887	

## 2. Hazard(s) identification

Physical hazards	Not classified.	
Health hazards	Reproductive toxicity	Category 1B
	Specific target organ toxicity, repeated exposure	Category 2 (cardiovascular system, kidney)
OSHA hazard(s)	Not classified.	
Label elements		



Signal word	Danger		
Hazard statement	May damage fertility or the unborn child. May cause damage to organs (cardiovascular system, kidney) through prolonged or repeated exposure.		
Precautionary statement			
Prevention	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust. Wear protective gloves/protective clothing/eye protection/face protection.		
Response	If exposed or concerned: Get medical advice/attention.		
Storage	Store locked up.		
Disposal	Dispose of contents/container to an approved disposal site.		
Hazard(s) not otherwise classified (HNOC)	Not classified.		

## 3. Composition/information on ingredients

### Substance

### Hazardous components

Chemical name	Common name and synonyms	CAS number	%
Furosemide	Frusemide	54-31-9	100

## 4. First-aid measures

<b>Inhalation</b>	Move to fresh air. Call a physician if symptoms develop or persist.
<b>Skin contact</b>	Rinse skin with water/shower. Get medical attention if irritation develops and persists.
<b>Eye contact</b>	Rinse with water. Get medical attention if irritation develops and persists.
<b>Ingestion</b>	Rinse mouth. Get medical attention if symptoms occur.
<b>Most important symptoms/effects, acute and delayed</b>	Fluid and electrolyte disturbances.
<b>Indication of immediate medical attention and special treatment needed</b>	Provide general supportive measures and treat symptomatically. Administer activated charcoal as a slurry. Correct fluid and electrolyte disturbances. Monitor blood pressure. Monitor serum electrolytes, Monitor carbon dioxide levels. Hemodialysis is unlikely to be of benefit. (PDR) (Poisindex)
<b>General information</b>	Remove from exposure. Remove contaminated clothing. For treatment advice, seek guidance from an occupational health physician or other licensed health-care provider familiar with workplace chemical exposures. In the United States, the national poison control center phone number is 1-800-222-1222. If person is not breathing, give artificial respiration. If breathing is difficult, give oxygen if available. Persons developing serious hypersensitivity (anaphylactic) reactions must receive immediate medical attention.

## 5. Fire-fighting measures

<b>Suitable extinguishing media</b>	Water spray, dry chemical, carbon dioxide, or foam as appropriate for surrounding fire and materials.
<b>Unsuitable extinguishing media</b>	None known.
<b>Specific hazards arising from the chemical</b>	No unusual fire or explosion hazards noted.
<b>Special protective equipment and precautions for firefighters</b>	Wear suitable protective equipment.
<b>Fire-fighting equipment/instructions</b>	As with all fires, evacuate personnel to a safe area. Firefighters should use self-contained breathing equipment and protective clothing.
<b>Specific methods</b>	Cool containers exposed to flames with water until well after the fire is out.

## 6. Accidental release measures

<b>Personal precautions, protective equipment and emergency procedures</b>	Keep unnecessary personnel away. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Wear appropriate personal protective equipment.
<b>Methods and materials for containment and cleaning up</b>	Sweep up or vacuum up spillage and collect in suitable container for disposal. Avoid the generation of dusts during clean-up. For waste disposal, see section 13 of the SDS. Wash spill site.

## 7. Handling and storage

<b>Precautions for safe handling</b>	As a general rule, when handling USP Reference Standards, avoid all contact and inhalation of dust, mists, and/or vapors associated with the material. Clean equipment and work surfaces with suitable detergent or solvent after use. After removing gloves, wash hands and other exposed skin thoroughly. Use of a designated area is recommended for handling of potent materials.
<b>Conditions for safe storage, including any incompatibilities</b>	Store in tight container as defined in the USP-NF. This material should be handled and stored per label instructions to ensure product integrity.

## 8. Exposure controls/personal protection

### Exposure limit values

#### Industrial Use

Material	Type	Value
Furosemide (CAS 54-31-9)	TWA	0.2 mg/m3
<b>Biological limit values</b>	No biological exposure limits noted for the ingredient(s).	
<b>Appropriate engineering controls</b>	Airborne exposure should be controlled primarily by engineering controls such as general dilution ventilation, local exhaust ventilation, or process enclosure. Local exhaust ventilation is generally preferred to general exhaust because it can control the contaminant at its source, preventing dispersion into the work area. An industrial hygiene survey involving air monitoring may be used to determine the effectiveness of engineering controls. Effectiveness of engineering controls intended for use with highly potent materials should be assessed by use of nontoxic surrogate materials. Local exhaust ventilation such as a laboratory fume hood or other vented enclosure is recommended, particularly for grinding, crushing, weighing, or other dust-generating procedures.	

## Individual protection measures, such as personal protective equipment

<b>Eye/face protection</b>	Safety glasses with sideshields are recommended. Face shields or goggles may be required if splash potential exists or if corrosive materials are present. Approved eye protection (e.g., bearing the ANSI Z87 or CSA stamp) is preferred. Maintain eyewash facilities in the work area.
<b>Skin protection</b>	
<b>Hand protection</b>	Chemically compatible gloves. For handling solutions, ensure that the glove material is protective against the solvent being used. Use handling practices that minimize direct hand contact. Employees who are sensitive to natural rubber (latex) should use nitrile or other synthetic nonlatex gloves. Use of powdered latex gloves should be avoided due to the risk of latex allergy.
<b>Other</b>	For handling of laboratory scale quantities, a cloth lab coat is recommended. Where significant quantities are handled, work clothing may be necessary to prevent take-home contamination.
<b>Respiratory protection</b>	Where respirators are deemed necessary to reduce or control occupational exposures, use NIOSH-approved respiratory protection and have an effective respirator program in place (applicable U.S. regulation OSHA 29 CFR 1910.134).
<b>Thermal hazards</b>	Not available.
<b>General hygiene considerations</b>	Handle in accordance with good industrial hygiene and safety practice.

## 9. Physical and chemical properties

<b>Appearance</b>	White to slightly yellow crystalline powder.
<b>Physical state</b>	Solid.
<b>Form</b>	Powder.
<b>Odor</b>	Odorless.
<b>Odor threshold</b>	Not available.
<b>pH</b>	5 (21 ° C; aqueous suspension)
<b>Melting point/freezing point</b>	397.4 - 402.8 °F (203 - 206 °C) (decomposes)
<b>Initial boiling point and boiling range</b>	Not available.
<b>Flash point</b>	Not available.
<b>Evaporation rate</b>	Not available.
<b>Flammability (solid, gas)</b>	Not applicable.
<b>Upper/lower flammability or explosive limits</b>	
<b>Flammability limit - lower (%)</b>	Not available.
<b>Flammability limit - upper (%)</b>	Not available.
<b>Explosive limit - lower (%)</b>	Not available.
<b>Explosive limit - upper (%)</b>	Not available.
<b>Vapor pressure</b>	< 0.0000001 kPa at 25 °C
<b>Vapor density</b>	Not available.
<b>Relative density</b>	Not available.
<b>Solubility in water</b>	Practically insoluble.
<b>Partition coefficient (n-octanol/water)</b>	2.03
<b>Auto-ignition temperature</b>	Not available.
<b>Viscosity</b>	Not available.
<b>Other information</b>	
<b>Chemical family</b>	Aromatic sulfanilamide derivative (sulfonamide).
<b>Molecular formula</b>	C12H11CIN2O5S
<b>Molecular weight</b>	330.75
<b>Solubility (other)</b>	Practically insoluble in dichloromethane; very slightly soluble in chloroform; sparingly soluble in alcohol; slightly soluble in ether; soluble or freely soluble in acetone and in dimethylformamide; soluble in methyl alcohol.

## 10. Stability and reactivity

<b>Reactivity</b>	No reactivity hazards known.
<b>Chemical stability</b>	Stable at normal conditions.
<b>Possibility of hazardous reactions</b>	No dangerous reaction known under conditions of normal use.

<b>Conditions to avoid</b>	None known.
<b>Incompatible materials</b>	Strong oxidizing agents.
<b>Hazardous decomposition products</b>	NOx. SOx. Cl-. Irritating and/or toxic fumes or gases. Emits toxic fumes under fire conditions.

## 11. Toxicological information

### Information on likely routes of exposure

<b>Ingestion</b>	Based on available data, the classification criteria are not met.
<b>Inhalation</b>	Due to lack of data the classification is not possible.
<b>Skin contact</b>	Due to lack of data the classification is not possible.
<b>Eye contact</b>	Based on available data, the classification criteria are not met.

**Symptoms related to the physical, chemical, and toxicological characteristics** Increased urination. Dry mouth. Thirst. Behavior, mood, or mental changes. Cramps. Nausea. Vomiting. Tiredness. Weakness. Blurred vision. Diarrhea. Headache. Skin sensitivity to sunlight. Loss of appetite. Dizziness. Stomach pain. Hearing problems.

**Delayed and immediate effects of exposure** Irregular heartbeat. Weak pulse. Blood volume reduction. Low blood pressure. Pancreatitis. Fluid and electrolyte imbalance. Mental status changes.

**Cross sensitivity** Persons sensitive to one sulfonamide (including thiazide diuretic) may be sensitive to this material also.

**Medical conditions aggravated by exposure** Active alcoholism. Anuria. Systemic lupus erythematosus. Porphyria. Diabetes. Kidney impairment. Liver impairment.

**Acute toxicity** Based on available data, the classification criteria are not met.

Product	Species	Test Results
Furosemide (CAS 54-31-9)		
<b>Acute</b>		
<i>Oral</i>		
LD50	Dog	2000 mg/kg
	Mouse	2200 mg/kg
	Rabbit	800 mg/kg
	Rat	2700 mg/kg

**Skin corrosion/irritation** Based on available data, the classification criteria are not met.

**Serious eye damage/eye irritation** Based on available data, the classification criteria are not met.

### Local effects

Irritancy test  
Result: Non-irritant.  
Species: Rabbit  
Organ: Eyes  
Irritancy test  
Result: Non-irritant.  
Species: Rabbit  
Organ: Skin

**Respiratory sensitization** Due to lack of data the classification is not possible.

**Skin sensitization** Due to lack of data the classification is not possible.

**Germ cell mutagenicity** Based on available data, the classification criteria are not met. Results of genotoxicity tests are mixed.

**Carcinogenicity** Based on available data, the classification criteria are not met. IARC: Group 3; this material is not classifiable as to its carcinogenicity in humans. This product is not considered to be a carcinogen by NTP. This material is not listed as a carcinogen by OSHA. Studies in animals have yielded mixed results.

**Reproductive toxicity** May damage fertility or the unborn child.

### Reproductivity

100 mg/kg/day Reproductivity study  
Result: Did not impair fertility.  
Species: Rat  
50 mg/kg Reproductivity study  
Result: Unexplained maternal deaths and miscarriages.  
Species: Rabbit  
600 mg/kg Reproductivity study  
Result: Increased resorption rates, decreased fetal weights, maternal deaths.  
Species: Rat

<b>Specific target organ toxicity - single exposure</b>	Based on available data, the classification criteria are not met.
<b>Specific target organ toxicity - repeated exposure</b>	May cause damage to organs (cardiovascular system, kidney) through prolonged or repeated exposure.
<b>Aspiration hazard</b>	Based on available data, the classification criteria are not met.

## 12. Ecological information

<b>Ecotoxicity</b>	No ecotoxicity data noted for the ingredient(s).
<b>Persistence and degradability</b>	No data is available on the degradability of this product.
<b>Bioaccumulative potential</b>	Not available.
<b>Mobility in soil</b>	Not available.
<b>Other adverse effects</b>	Not available.

## 13. Disposal considerations

<b>Disposal instructions</b>	This product, in its present state, when discarded or disposed of, is not a hazardous waste according to Federal regulations (40 CFR 261.4 (b)(4)). Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste.
<b>Local disposal regulations</b>	Not available.
<b>Hazardous waste code</b>	Not regulated.
<b>Waste from residues / unused products</b>	Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
<b>Contaminated packaging</b>	Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

## 14. Transport information

### DOT

Not regulated as a hazardous material by DOT.

### IATA

Not regulated as a dangerous good.

<b>Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code</b>	No information available.
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## 15. Regulatory information

<b>US federal regulations</b>	CERCLA/SARA Hazardous Substances - Not applicable.  One or more components are not listed on TSCA.
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### Superfund Amendments and Reauthorization Act of 1986 (SARA)

<b>Hazard categories</b>	Immediate Hazard - Yes Delayed Hazard - No Fire Hazard - Yes Pressure Hazard - No Reactivity Hazard - No
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<b>SARA 302 Extremely hazardous substance</b>	No
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<b>SARA 311/312 Hazardous chemical</b>	No
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### Other federal regulations

<b>Safe Drinking Water Act (SDWA)</b>	Not regulated.
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<b>Food and Drug Administration (FDA)</b>	Not regulated.
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<b>US state regulations</b>	California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.
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### International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No

Country(s) or region	Inventory name	On inventory (yes/no)*
China	Inventory of Existing Chemical Substances in China (IECSC)	No
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	No

\*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

## 16. Other information, including date of preparation or last revision

<b>Issue date</b>	08-14-2008
<b>Revision date</b>	03-08-2013
<b>Version #</b>	02
<b>Further information</b>	Not available.
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<b>Revision Information</b>	This document has undergone significant changes and should be reviewed in its entirety.