

SAFETY DATA SHEET

1. Identification

Product identifier BENEDICT'S SOLUTION, QUANTITATIVE

Other means of identification

Product code 2035

Recommended use professional, scientific and technical activities: other professional, scientific and technical activities

Recommended restrictions None known.

Manufacturer/Importer/Supplier/Distributor information

Company name GFS Chemicals, Inc. **Address** P.O. Box 245

> Powell OH 43065 US

Telephone Phone 740-881-5501

> Toll Free 800-858-9682 Fax 740-881-5989

Website www.gfschemicals.com E-mail service@gfschemicals.com

Emergency phone Emergency Assistance

number

2. Hazard(s) identification

Physical hazards Not classified.

Health hazards Serious eye damage/eye irritation Category 2A

> Sensitization, skin Category 1 Germ cell mutagenicity Category 2 Reproductive toxicity Category 2

Specific target organ toxicity, single exposure Category 1 (blood system, kidney, liver,

Chemtrec 800-424-9300

nervous system, respiratory system)

Specific target organ toxicity, repeated Category 1 (blood system, kidney, respiratory

system)

exposure

Not classified.

OSHA hazard(s) **Label elements**



Signal word Danger

Hazard statement May cause an allergic skin reaction. Causes serious eye irritation. Suspected of causing genetic

defects. Suspected of damaging fertility or the unborn child. Causes damage to organs (blood system, kidney, liver, nervous system, respiratory system). Causes damage to organs (blood system, kidney, respiratory system) through prolonged or repeated exposure. Very toxic to

aquatic life. Harmful to aquatic life with long lasting effects.

Precautionary statement

Prevention Obtain special instructions before use. Do not handle until all safety precautions have been read

and understood. Do not breathe mist or vapor. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Contaminated work clothing must not be allowed out of the

workplace. Wear protective gloves/protective clothing/eye protection/face protection.

Response IF ON SKIN: Wash with plenty of soap and water. If in eyes: Rinse cautiously with water for

several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If exposed or concerned: Get medical advice/attention. If skin irritation or rash occurs: Get medical

advice/attention. If eye irritation persists: Get medical advice/attention. Wash contaminated

clothing before reuse.

Storage Store locked up.

Material name: BENEDICT'S SOLUTION, QUANTITATIVE 2035 Version #: 01 Revision date: Issue date: August-28-2013 **Disposal** Dispose of contents/container to an approved waste disposal plant.

Hazard(s) not otherwise classified (HNOC)

Not classified.

Environmental hazards Hazardous to the aquatic environment, acute Category 1

Hazardous to the aquatic environment,

long-term hazard

Supplemental information **Precautionary statement**

> **Prevention** Avoid release to the environment.

Response Collect spillage.

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

Category 3

20.1% of the mixture consists of component(s) of unknown acute hazards to the aquatic environment. 20.1% of the mixture consists of component(s) of unknown long-term hazards to the aquatic environment.

3. Composition/information on ingredients

Mixtures

Hazardous components				
Chemical name	CAS number	%		
POTASSIUM THIOCYANATE	333-20-0	12.5		
SODIUM CARBONATE	497-19-8	8.7		
CUPRIC SULFATE	7758-99-8	1.8		
Non-hazardous components				
Chemical name	CAS number	%		
WATER	7732-18-5	>55		
SODIUM CITRATE, DIHYDRATE	6132-04-3	20		

^{*}Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. First-aid measures

TRIHYDRATE

POTASSIUM FERROCYANIDE,

Inhalation Move to fresh air. Call a physician if symptoms develop or persist.

Skin contact Wash off with soap and plenty of water. For minor skin contact, avoid spreading material on

unaffected skin. If skin irritation or rash occurs: Get medical advice/attention.

Eye contact Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.

Continue rinsing. If eye irritation persists: Get medical advice/attention.

Ingestion Get medical advice/attention if you feel unwell.

Most important

symptoms/effects, acute and

delayed

Irritation of eyes and mucous membranes. May cause allergic skin reaction. Narcosis. Decrease in motor functions. Behavioral changes. Edema. Liver enlargement. Jaundice. Proteinuria. Prolonged

14459-95-1

< 0.1

exposure may cause chronic effects.

Indication of immediate medical attention and special

treatment needed

Provide general supportive measures and treat symptomatically.

General information Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. IF exposed or concerned: Get medical advice/attention. Wash contaminated

clothing before reuse.

5. Fire-fighting measures

Suitable extinguishing media Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2). Powder. Use extinguishing agent

suitable for type of surrounding fire.

Unsuitable extinguishing

media

None known.

Specific hazards arising from

the chemical

Not applicable.

Special protective equipment

and precautions for

firefighters

Wear suitable protective equipment.

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Water runoff can cause environmental damage.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Keep unnecessary personnel away. Local authorities should be advised if significant spillages cannot be contained. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Keep people away from and upwind of spill/leak. Keep upwind. Keep out of low areas. Ensure adequate ventilation. Avoid inhalation of vapors or mists. Wear appropriate personal protective equipment.

Methods and materials for containment and cleaning up

This product is miscible in water. Stop the flow of material, if this is without risk.

Large Spills: Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. This material is classified as a water pollutant under the Clean Water Act and should be prevented from contaminating soil or from entering sewage and drainage systems which lead to waterways.

Never return spills in original containers for re-use. For waste disposal, see section 13 of the MSDS.

Environmental precautions

Contact local authorities in case of spillage to drain/aquatic environment. Avoid discharge into drains, water courses or onto the ground. Avoid release to the environment. Prevent further leakage or spillage if safe to do so. Do not contaminate water.

7. Handling and storage

Precautions for safe handling

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe mist or vapor. Avoid contact with skin. Avoid contact with eyes. Avoid contact during pregnancy/while nursing. Use personal protective equipment as required. Avoid prolonged exposure. When using, do not eat, drink or smoke. Wash hands thoroughly after handling. Avoid release to the environment. Do not empty into drains.

Conditions for safe storage, including any incompatibilities

Store locked up. Keep container tightly closed. Keep out of the reach of children. Store in a cool, dry place out of direct sunlight.

8. Exposure controls/personal protection

Occupational exposure limits

US. NIOSH: Pocket Guide to Chemical Hazards Components **Type**

Value TWA **CUPRIC SULFATE (CAS** 1 mg/m3 Dust and mist. 7758-99-8)

Biological limit values

No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. An eye wash and safety shower must be available in the immediate work area.

Form

Individual protection measures, such as personal protective equipment

Eye/face protection Wear eye/face protection.

Skin protection

Hand protection Wear protective gloves.

Other Wear suitable protective clothing. Wear protective gloves.

Respiratory protection No personal respiratory protective equipment normally required.

Thermal hazards Not available.

General hygiene considerations

When using, do not eat, drink or smoke. Avoid contact with eyes. Avoid contact with skin. Wash hands before breaks and immediately after handling the product. Contaminated work clothing should not be allowed out of the workplace. Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Appearance Clear. **Physical state** Liquid.

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Form Aqueous solution.

ColorLight blue.OdorOdorless.Odor thresholdNot available.pHNot available.Melting point/freezing point< 32 °F (< 0 °C)</th>

Initial boiling point and

ilitiai bollilig þ

> 212 °F (> 100 °C)

boiling range

Flash point Not available.

Evaporation rate Not available.

Flammability (solid, gas) Not applicable.

Upper/lower flammability or explosive limits

Flammability limit - lower

Not available.

(%)

Flammability limit -

upper (%)

Not available.

Explosive limit - lower

(%)

Not available.

Explosive limit - upper

(%)

Not available.

Vapor pressure 0.000011 hPa estimated

Vapor densityNot available.Relative densityNot available.Solubility(ies)MisciblePartition coefficientNot available.

(n-octanol/water)

Auto-ignition temperatureNot available.Decomposition temperatureNot available.ViscosityNot available.

Other information

Density 1.20 g/cm3 estimated

Percent volatile > 55 %

Specific gravity 1.2 estimated

10. Stability and reactivity

Reactivity Not available.

Chemical stability Material is stable under normal conditions. **Possibility of hazardous** Hazardous polymerization does not occur.

reactions

Conditions to avoidNone under normal conditions. **Incompatible materials**Strong oxidizing agents. Strong acids.

Hazardous decompositionNo hazardous decomposition products are known.

products

11. Toxicological information

Information on likely routes of exposure

Ingestion Not available.

Inhalation Due to lack of data the classification is not possible.

Skin contact May cause an allergic skin reaction.

Eye contact Causes serious eye irritation.

Symptoms related to the physical, chemical and toxicological characteristics

Narcosis. Edema. Liver enlargement. Jaundice. Proteinuria. Behavioral changes. Decrease in motor

functions.

Information on toxicological effects

Acute toxicity

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Product Species Test Results BENEDICT'S SOLUTION, QUANTITATIVE (CAS Mixture) **Acute** Inhalation LC50 Guinea pig 9.1954 mg/l, 2 Hours, estimated 8.024 mg/l Mouse 13.7931 mg/l, 2 Hours, estimated 12.04 mg/l Rat 26.4368 mg/l, 2 Hours, estimated 23.07 mg/l Oral LD100 Mouse 2777.7778 mg/kg, estimated LD50 Rabbit 6944.4443 mg/kg, estimated Rat 3883.2637 mg/kg, estimated 60444.4453 mg/kg, estimated LDL0 Human Other LD50 1340.2299 mg/kg, 30 Days, estimated Mouse Rabbit 444.4445 g/kg, estimated **Components Species Test Results** CUPRIC SULFATE (CAS 7758-99-8) Acute Oral LD100 Mouse 50 mg/kg LD50 Rabbit 125 mg/kg Rat 300 mg/kg LDL0 1088 mg/kg Human Other LD50 Rabbit > 8 g/kg> 8 g/kg POTASSIUM FERROCYANIDE, TRIHYDRATE (CAS 14459-95-1) **Acute** Oral LD50 Rat 6400 mg/kg, (anhydrous) POTASSIUM THIOCYANATE (CAS 333-20-0) **Acute** Oral LD50 Rat 854 mg/kg SODIUM CARBONATE (CAS 497-19-8) **Acute** Inhalation LC50 Guinea pig 0.8 mg/l, 2 Hours Mouse 1.2 mg/l, 2 Hours Rat 2.3 mg/l, 2 Hours Oral LD50 Rat 4090 mg/kg Other LD50 Mouse 2210 mg/kg 116.6 mg/kg, 30 Days

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SDS US

Components Species Test Results

SODIUM CITRATE, DIHYDRATE (CAS 6132-04-3)

Acute

Oral

LD50 Rat 6730 mg/kg

* Estimates for product may be based on additional component data not shown.

Skin corrosion/irritation Due to lack of data the classification is not possible.

Serious eye damage/eye

irritation

Causes serious eye irritation.

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

Skin sensitizationMay cause an allergic skin reaction.Germ cell mutagenicitySuspected of causing genetic defects.

Carcinogenicity This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

Reproductive toxicity Suspected of damaging fertility or the unborn child.

Specific target organ toxicity

Specific target organ toxicity

- single exposure

- repeated exposure

Causes damage to organs (blood system, kidney, liver, nervous system, respiratory system).

Causes damage to organs (blood system, kidney, respiratory system) through prolonged or repeated exposure.

Aspiration hazard Due to lack of data the classification is not possible.

Chronic effects Prolonged inhalation may be harmful. Causes damage to organs through prolonged or repeated

exposure.

12. Ecological information

Ecotoxicity Very toxic to aquatic life. Harmful to aquatic life with long lasting effects. Accumulation in aquatic

organisms is expected.

Product		Species	Test Results
BENEDICT'S SOLUTIO	N, QUANTITATIVE	(CAS Mixture)	
Crustacea	EC50	Daphnia	318.6569 mg/l, 48 hours, estimated
Fish	LC50	Fish	35.6664 mg/l, 96 hours, estimated
Components		Species	Test Results
CUPRIC SULFATE (CA	S 7758-99-8)		
Aquatic			
Crustacea	EC50	Water flea (Bosmina longirostris)	0.0037 mg/l, 48 hours
Fish	LC50	Bluegill (Lepomis macrochirus)	0.66 - 1.15 mg/l, 96 hours
POTASSIUM FERROCY	ANIDE, TRIHYDRA	TE (CAS 14459-95-1)	
Aquatic			
Crustacea	LC50	Water flea (Daphnia pulex)	67 - 140 mg/l, 24 hours
		45 - 103 mg/l, 48 hours	
Fish	LC50	Rainbow trout, donaldson trout (Oncorhynchus mykiss)	> 867 mg/l, 96 hours
			828 - 1064 mg/l, 96 hours
			474 - 1190 mg/l, 96 hours
			184 - 261 mg/l, 96 hours
			178 - 302 mg/l, 96 hours
			37.4 mg/l, 96 hours
			28.7 - 37.9 mg/l, 96 hours
			28.7 - 37.9 mg/l, 96 hours
POTASSIUM THIOCYA	NATE (CAS 333-20	l-0)	5. ,
Aquatic	(,	
- Fish	LC50	Brook trout (Salvelinus fontinalis)	> 88.5 mg/l, 96 hours
SODIUM CARBONATE	(CAS 497-19-8)		
Aquatic	•		
Crustacea	EC50	Water flea (Ceriodaphnia dubia)	156.6 - 298.9 mg/l, 48 hours

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Components		Species	Test Results	
Fish	LC50	Bluegill (Lepomis macrochirus)	300 mg/l, 96 hours	
SODIUM CITRATE, DIHYDRATE (CAS 6132-04-3)				
Aquatic				
Crustacea	EC50	Water flea (Ceriodaphnia dubia)	655 - 825.9 mg/l, 48 hours	
			655 - 825.9 mg/l, 48 hours	
	LC50	Water flea (Daphnia magna)	3330 mg/l, 24 hours	

Persistence and degradability No data is available on the degradability of this product.

Bioaccumulative potential Not available. Mobility in soil Not available. Other adverse effects Not available.

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. This material

> and its container must be disposed of as hazardous waste. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international

regulations.

Local disposal regulations Not available. Hazardous waste code Not regulated.

Waste from residues / Dispose of in accordance with local regulations. Empty containers or liners may retain some unused products product residues. This material and its container must be disposed of in a safe manner (see:

Disposal instructions).

Contaminated packaging 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

Not regulated as a hazardous material by DOT.

IATA

Not regulated as a dangerous good.

IMDG

Not regulated as a dangerous good.

Transport in bulk according to Annex II of MARPOL

No information available.

73/78 and the IBC Code

General information DOT Regulated Marine Pollutant. IMDG Regulated Marine Pollutant.

15. Regulatory information

US federal regulations All components are on the U.S. EPA TSCA Inventory List.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not on regulatory list.

CERCLA Hazardous Substance List (40 CFR 302.4)

CUPRIC SULFATE (CAS 7758-99-8) **LISTED**

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes Delayed Hazard - No

Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No

SARA 302 Extremely hazardous substance No

SARA 311/312

No **Hazardous chemical**

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^{*} Estimates for product may be based on additional component data not shown.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act Not regulated.

(SDWA)

Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2) and **Chemical Code Number**

Not listed

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

Not regulated.

DEA Exempt Chemical Mixtures Code Number

Not regulated.

Food and Drug Not regulated.

Administration (FDA)

US state regulations 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.

US. Massachusetts RTK - Substance List

CUPRIC SULFATE (CAS 7758-99-8)

US. New Jersey Worker and Community Right-to-Know Act

CUPRIC SULFATE (CAS 7758-99-8) 500 LBS

US. Pennsylvania RTK - Hazardous Substances

CUPRIC SULFATE (CAS 7758-99-8)

US. Rhode Island RTK

Not regulated.

US. California Proposition 65

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Not listed.

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
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
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	Yes

^{*}A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s)

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

Issue date August-28-2013

Version # Λ1

Further information Not available.

Disclaimer The information in the sheet was written based on the best knowledge and experience currently

available. The information given is designed only as a quidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified

in the text.

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Revision Information

Composition / Information on Ingredients: Ingredients Physical & Chemical Properties: Multiple Properties Regulatory Information: Canada

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