

Benedict's Quantitative Solution

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Benedict's Quantitative Solution

Synonyms/Generic Names: Benedict's Sugar Test Reagent

SDS Number: 92.00

Product Use: For Educational Use Only

Manufacturer: Columbus Chemical Industries, Inc.
N4335 Temkin Rd.
Columbus, WI. 53925

For More Information Contact: Ward's Science
5100 West Henrietta Rd.
PO Box 92912-9012
Rochester, NY 14692
(800) 962-2660 (Monday-Friday 7:30-7:00 Eastern Time)

In Case of Emergency Call: CHEMTREC - 800-424-9300 or 703-527-3887 (24 Hours/Day, 7 Days/Week)

2. HAZARDS IDENTIFICATION

OSHA Hazards: Target organ effect, Toxic by ingestion, Irritant

Target Organs: Liver, Kidney, Blood

Signal Word: Warning

Pictograms:



GHS Classification:

Skin irritation	Category 3
Acute aquatic toxicity	Category 1

GHS Label Elements, including precautionary statements:

Hazard Statements:

H316	Causes mild skin irritation.
H400	Very toxic to aquatic life.

Precautionary Statements:

P273	Avoid release to the environment.
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Potential Health Effects

Eyes	Causes eye irritation.
Inhalation	May be harmful if inhaled. Causes respiratory tract irritation.
Skin	May be harmful if absorbed through skin. Causes skin irritation.
Ingestion	Toxic if swallowed.

NFPA Ratings

Health	1
Flammability	0
Reactivity	0
Specific hazard	Not Available

HMIS Ratings

Health	1
Fire	0
Reactivity	0
Personal	H

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	Weight %	CAS #	EINECS# / ELINCS#	Formula	Molecular Weight
Cupric Sulfate	1-2	7758-98-7	231-847-6	CuO ₄ S	159.61 g/mol
Sodium Citrate	16-17	68-04-2	200-675-3	C ₆ H ₅ O ₇ Na ₃ · 2H ₂ O	294.10 g/mol
Sodium Carbonate	6-7	497-19-8	207-838-8	Na ₂ CO ₃	105.99 g/mol
Potassium Ferrocyanide	<1	14459-95-1	237-722-2	K ₄ Fe(CN) ₆ · 3H ₂ O	422.39 g/mol
Potassium Thiocyanate	10-11	333-20-0	206-370-1	KCNS	97.18 g/mol
Water	62-63	7732-18-5	231-791-2	H ₂ O	18.00 g/mol

4. FIRST-AID MEASURES

Eyes	Rinse with plenty of water for at least 15 minutes and seek medical attention.
Inhalation	Move casualty to fresh air and keep at rest. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.
Skin	Flush with plenty of water and wash using soap. Get medical attention if necessary.
Ingestion	Do Not Induce Vomiting! Never give anything by mouth to an unconscious person. If conscious, wash out mouth with water. Get medical attention if necessary.

5. FIRE-FIGHTING MEASURES

Suitable (and unsuitable) extinguishing media	Product is not flammable. Use appropriate media for adjacent fire. Cool containers with water.
Special protective equipment and precautions for firefighters	Wear self-contained, approved breathing apparatus and full protective clothing, including eye protection and boots.
Specific hazards arising from the chemical	Emits toxic fumes (carbon oxides, nitrogen oxides, potassium oxides, sulfur oxides, copper oxides, sodium oxides, iron oxides) under fire conditions. (See also Stability and Reactivity section).

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	See section 8 for recommendations on the use of personal protective equipment.
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Environmental precautions	Prevent spillage from entering drains. Any release to the environment may be subject to federal/national or local reporting requirements.
Methods and materials for containment and cleaning up	Absorb spill with noncombustible absorbent material, then place in a suitable container for disposal. Clean surfaces thoroughly with water to remove residual contamination. Dispose of all waste and cleanup materials in accordance with regulations.

7. HANDLING AND STORAGE

Precautions for safe handling

See section 8 for recommendations on the use of personal protective equipment. Use with adequate ventilation. Wash thoroughly after using. Keep container closed when not in use. Avoid formation of aerosols.

Conditions for safe storage, including any incompatibilities

Store in cool, dry well ventilated area. Keep away from incompatible materials (see section 10 for incompatibilities).

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational exposure controls:

Component	Exposure Limits	Basis	Entity
Copper Sulfate	1 mg/m ³	REL	NIOSH
Potassium Thiocyanate	5 mg/m ³	STEL	OSHA

TWA: Time Weighted Average over 8 hours of work.

TLV: Threshold Limit Value over 8 hours of work.

REL: Recommended Exposure Limit

PEL: Permissible Exposure Limit

STEL: Short Term Exposure Limit during x minutes.

IDLH: Immediately Dangerous to Life or Health

WEEL: Workplace Environmental Exposure Levels

CEIL: Ceiling

Personal Protection

Eyes	Wear chemical safety glasses or goggles.
Inhalation	Provide local exhaust, preferably mechanical. If exposure levels are excessive, use an approved respirator.
Skin	Wear nitrile or rubber gloves, and apron or lab coat.
Other	Not Available

Other Recommendations

Provide eyewash stations, quick-drench showers and washing facilities accessible to areas of use and handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance (physical state, color, etc.)	Translucent blue liquid.
Odor	Slight ammonia odor.
Odor threshold	Not Available
pH	Not Available
Melting point/freezing point	Not Available
Initial boiling point and boiling range	Not Available

Flash point	Not Flammable
Evaporation rate	Not Available
Flammability (solid, gas)	Not Flammable
Upper/lower flammability or explosive limit	Not Explosive
Vapor pressure	Not Available
Vapor density	Not Available
Density	Not Available
Solubility (ies)	Not Available
Partition coefficient: n-octanol/water	Not Available
Auto-ignition temperature	Not Available
Decomposition temperature	Not Available

10. STABILITY AND REACTIVITY

Chemical Stability	Stable
Possibility of Hazardous Reactions	Will not occur.
Conditions to Avoid	Not Available
Incompatible Materials	Strong oxidizing agents.
Hazardous Decomposition Products	Carbon oxides, nitrogen oxides, potassium oxides, sulfur oxides, copper oxides, sodium oxides, iron oxides.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Cupric Sulfate

Skin	LD50 Dermal – rat - > 2000 mg/kg
Eyes	Not Available
Respiratory	Not Available
Ingestion	LD50 Oral – rat – 300 mg/kg
Other	LD50 Intraperitoneal – Rat – 20 mg/kg LD50 Intravenous – Rat – 48.9 mg/kg LD50 Subcutaneous – Rat – 43 mg/kg

Sodium Citrate

Skin	Not Available
Eyes	Not Available
Respiratory	Not Available
Ingestion	Not Available

Sodium Carbonate

Skin	Not Available
Eyes	Not Available
Respiratory	LC50 Inhalation - rat - 2 h - 5,750 mg/l
Ingestion	LD50 Oral - rat - 4,090 mg/kg

Potassium Ferrocyanide

Skin	Not Available
Eyes	Not Available
Respiratory	Not Available
Ingestion	LD50 Oral - rat - 3,613 mg/kg

Potassium Thiocyanate

Skin	Not Available
Eyes	Not Available
Respiratory	Not Available
Ingestion	LD50 Oral - rat - 854 mg/kg

Carcinogenicity

IARC	No components of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH	No components of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP	No components of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA	No components of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Signs & Symptoms of Exposure

Skin	Irritation, redness, itching.
Eyes	Redness, tearing, itching, burning, conjunctivitis.
Respiratory	Irritation of mucous membranes, coughing, wheezing, shortness of breath.
Ingestion	Irritation and burning sensations of mouth and throat, nausea, vomiting and abdominal pain.

Chronic Toxicity	Not Available
Teratogenicity	Not Available
Mutagenicity	Not Available
Embryotoxicity	Not Available
Specific Target Organ Toxicity	Not Available
Reproductive Toxicity	Not Available
Respiratory/Skin Sensitization	Not Available

12. ECOLOGICAL INFORMATION**Ecotoxicity***Cupric Sulfate*

Aquatic Vertebrate	Not Available
Aquatic Invertebrate	EC50 – Daphnia magna – 0.024 mg/l – 48 hours
Terrestrial	Not Available

Sodium Citrate

Aquatic Vertebrate	Not Available
Aquatic Invertebrate	Not Available
Terrestrial	Not Available

Sodium Carbonate

Aquatic Vertebrate	LC50 - Lepomis macrochirus (Bluegill) - 300 mg/l - 96 h
Aquatic Invertebrate	EC50 - Daphnia magna (Water flea) - 265 mg/l - 48 h
Terrestrial	Not Available

Potassium Ferrocyanide

Aquatic Vertebrate	EC50 - Daphnia - 32 mg/l - 48 h
Aquatic Invertebrate	Not Available
Terrestrial	Not Available

Potassium Thiocyanate

Aquatic Vertebrate	LC50 - Oncorhynchus mykiss (rainbow trout) - > 100 mg/l - 96.0 h
Aquatic Invertebrate	EC50 - Daphnia magna (Water flea) - 11 mg/l - 48 h
Terrestrial	Not Available

Persistence and Degradability	Not Available
Bioaccumulative Potential	Not Available
Mobility in Soil	Not Available
PBT and vPvB Assessment	Not Available
Other Adverse Effects	Not Available

13. DISPOSAL CONSIDERATIONS

Waste Residues	Users should review their operations in terms of the applicable federal/national or local regulations and consult with appropriate regulatory agencies if necessary before disposing of waste product or residues.
Product Containers	Users should review their operations in terms of the applicable federal/national or local regulations and consult with appropriate regulatory agencies if necessary before disposing of waste product container.

The information offered in section 13 is for the product as shipped. Use and/or alterations to the product may significantly change the characteristics of the material and alter the waste classification and proper disposal methods.

14. TRANSPORTATION INFORMATION

US DOT	Not Dangerous Goods
TDG	Not Dangerous Goods
IMDG	Not Dangerous Goods
Marine Pollutant	No
IATA/ICAO	Not Dangerous Goods

15. REGULATORY INFORMATION

TSCA Inventory Status	All ingredients are listed on the TSCA inventory.
DSCL (EEC)	All ingredients are listed on the DSCL inventory.
California Proposition 65	Not Listed
SARA 302	Not Listed
SARA 304	Not Listed
SARA 311	Copper Sulfate, Potassium Thiocyanate, Potassium Ferrocyanide
SARA 312	Copper Sulfate, Potassium Thiocyanate, Potassium Ferrocyanide
SARA 313	Listed: Copper Sulfate
WHMIS Canada	Class D-1B: Poisonous and infectious material- Immediate and serious effects- Toxic Class D-2B: Poisonous and infectious material- Other effects- Toxic

16. OTHER INFORMATION

Revision	Date
Revision 1	01/11/2013
Revision 2	06/21/2013

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