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School Materials Safety Manual:

No. 308 Sucrose Issued 2/92

♦ SECTION 1 INTRODUCTION

Material Sucrose, ca 100%

Synonyms beet sugar, cane sugar, confectioner's sugar, α -D-glucopyranosyl β -D-fructofuranoside, (α -D-glucosido)- β -D-fructofuranoside, granulated sugar, NCI-C56597, rock candy, saccharose, saccharum, sugar, table sugar

Chemical Formula $C_{12}H_{22}O_{11}$

CAS Number 57-50-1

DOT Classification Not listed as a Hazardous Material for Transportation (49 CFR 172.101)

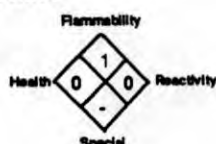
EPA Classification Not listed as a RCRA Hazardous Waste (40 CFR 261.33), a CERCLA Hazardous Substance (40 CFR 302.4), a SARA Extremely Hazardous Substance (40 CFR 355), or a SARA Toxic Chemical (40 CFR 372.65)

OSHA Classification Listed as an Air Contaminant (29 CFR 1910.1000, Table Z-1-A)

NFPA Hazard Rating Not found

Genium Hazard Rating

- 4 = Extreme
3 = High
2 = Moderate
1 = Slight
0 = Minimum



HMIS

- H 0
F 1
R 0

Description Hard, white, dry crystals, lumps, or powder with a sweet taste and no odor. Obtained by crushing and extraction of sugar cane (*Saccharum officinarum* L., *Gramineae*) and sugar beet (*Beta vulgaris* L., *Chenopodiaceae*) with water, evaporating, and purifying with lime, carbon, and various liquids. Sugar cane and sugar beet contain 15-20% and 10-17% sucrose, respectively.

Overview In the school environment, sucrose is used in biology and chemistry laboratories. It is a combustible solid. Avoid generating dusty conditions. Do not consume sucrose purchased for and used in the laboratory. Also used as a sweetener in foods and soft drinks, a starting material in fermentative production of ethanol, butanol, glycerol citric acid, and levulinic acids, an additive in wine making; in pharmacy as a preservative, a flavor, a substitute for glycerol, a demulcent, a coating for tablets, a granulation agent and an excipient for tablets, and an antioxidant (in the form of invert sugar); in manufacturing syrups, inks, and transparent soaps; in the plastics and cellulose industry; in rigid polyurethane foams.

Manufacturer Always request an up-to-date MSDS from your chemical supplier. That sheet should include the manufacturer and their emergency phone numbers. This *Manual's* Resources/Manufacturers Index lists some larger manufacturers and available emergency phone numbers.

♦ SECTION 2 USE AND STORAGE DATA

Preliminary Planning Considerations Plan and provide for safe disposal of all school-generated chemical waste. Check applicable regulations prior to use. Contact lens use when handling chemical materials is controversial. In some cases, soft lenses can actually protect eyes from chemicals. In other cases, chemical entrapment is presumed a possible hazard. Particles adhering to contact lens surfaces can cause corneal damage. For safety, always wear safety glasses or goggles. Wear rubber gloves to minimize skin contact. Employees and

students should know the location of eyewash and shower facilities near chemical use areas. Check that eyewash stations and safety showers are working properly.

Usage Precautions and Procedure Before using, read this material's container label and follow all precautions. Do not ingest sucrose from the lab. Do not smoke in usage or storage areas. Practice good housekeeping to avoid unintentionally mixing incompatibles. Do not allow chemical residue or dust buildup in lab or work areas. Keep sucrose and other lab chemicals away from notebooks, textbooks, and personal belongings to avoid transporting chemical residues from the lab/work area. After working with chemical materials, and before eating, drinking, or smoking, always wash hands and face. Remove and launder contaminated clothing before reusing.

Additional Data Sucrose is stable at room temperature under normal handling and storage conditions. It does not polymerize. A vigorous reaction occurs with nitric acid or sulfuric acid (forms carbon monoxide and carbon dioxide).

Preferred Storage Location and Methods Store in tightly closed containers in cool, well-ventilated area away from heat and ignition sources. To separate incompatible chemicals, store by chemical family, not by alphabetical name. Protect all chemical containers from physical damage and avoid contamination. Prohibit smoking in chemical storage areas. Purchase amounts sufficient for one year or less.

♦ SECTION 3 SPILL/DISPOSAL PROCEDURES

If Spilled Eliminate all heat and ignition sources. Clean up spilled material promptly and thoroughly. For dry spills, carefully scoop spilled material into secure disposal or reclamation containers. Damp mop to avoid generating dusty conditions. For liquid (solution) spills, absorb with paper towels. As needed, dike spill area with inert absorbent material to contain.

Disposal of Small Quantities Dilute and uncontaminated sucrose solutions can be safely flushed to drains.

Disposal of Larger Amounts Contact your supplier or a licensed disposal company.

Follow all applicable local, state, and Federal regulations for all waste disposal.

♦ SECTION 4 HEALTH HAZARDS

Sucrose is mildly toxic by ingestion. Experimental studies with laboratory animals show that very high sucrose doses cause teratogenic, mutagenic, and reproductive effects in laboratory animals.

1991-92 ACGIH TLV 8-hr TWA: 10 mg/m³ (total dust)

1990 NIOSH REL 10-hr TWA: 10 mg/m³ (total dust), 5 mg/m³ (respirable fraction)

1990 OSHA PEL 8-hr TWA: 15 mg/m³ (total dust), 5 mg/m³ (respirable fraction)

1985-6 Toxicity Data Rat (female), oral, LD₅₀: 29700 mg/kg; toxic effects not yet reviewed. Rat, oral, TD_{Lo}: 1548 g/kg administered to female for 21 days prior to mating and for 1-22 days during gestation produced specific developmental abnormalities (central nervous system).

Carcinogenicity Not listed by the NTP, IARC, or OSHA
Acute Effects Ingestion of large amounts may cause vomiting and diarrhea.
Chronic Effects None reported

♦ SECTION 5 FIRST AID PROCEDURES

Eye Contact Promptly flush eyes with plenty of running water for at least 15 min, including under eyelids. Seek medical attention if irritation develops.

Skin Contact After flushing with water, wash exposed areas with soap and water.

Inhalation Remove victim from exposure to fresh air and support breathing as necessary.

Ingestion Never give anything by mouth to an unconscious or convulsing person. If large amounts are ingested, have that *conscious and alert* person drink 1 to 2 glasses of water to dilute.

Get proper in-school, paramedic, or community medical attention and support.

♦ SECTION 6 FIRE PROCEDURES AND DATA

Fire Hazards Sucrose is a combustible solid and finely divided sucrose (in sufficient concentration) may explode in air if subjected to an ignition source. Avoid generating dusty conditions. For major fires, or for fires involving large quantities, firefighters should wear appropriate protective clothing and respirators. Because fire may produce toxic thermal decomposition products, a self-contained breathing apparatus (SCBA) is recommended.

Flash Point and Method None reported

Autoignition Temperature None reported

Flammability Limits in Air (vol. %) None reported

Hazardous Decomposition Products Thermal oxidative decomposition of sucrose can produce acrid smoke and irritating fumes with a characteristic odor of caramel.

Extinguishing Media Water.

♦ SECTION 7 PHYSICAL DATA

Boiling Point Decomposes at 320-367 °F (160-186 °C)*

Melting Point Range Decomposes at 338-367 °F (170-186 °C)

Solubility in Water Soluble; 1 g dissolves in 0.5 mL water

Other Solubilities Soluble in methanol; moderately soluble in glycerol and pyridine; slightly soluble in alcohol; insoluble in ether

pH of Aqueous Solution Neutral to litmus

Molecular Weight 342.30

Density 1.587 at 77 °F (25 °C)

* The energy of decomposition (in 280-350 °C range) is measured as 0.48 kJ/g.

References 73, 101, 103, 124, 126, 127, 132, 136, 139, 143, 149, 162, 163; Genium's *College Chemistry Laboratory Manual* (1/92)

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