

SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

Product Identifier

SRM Number: 4990C

SRM Name: Oxalic Acid

Other Means of Identification: Not applicable.

Recommended Use of This Material and Restrictions of Use

This Standard Reference Material (SRM) is intended as an international standard reference material for contemporary carbon-14. A unit of SRM 4990C consists of a 227-gram (one-half-pound) portion of a 454-kilogram (1000-pound) lot of oxalic acid prepared by fermentation of French beet molasses, from the 1977 spring, summer, and autumn harvests, using *Aspergillus niger* var.

Company Information

National Institute of Standards and Technology
Standard Reference Materials Program
100 Bureau Drive, Stop 2300
Gaithersburg, Maryland 20899-2300

Telephone: 301-975-2200
FAX: 301-948-3730
E-mail: SRMMSDS@nist.gov
Website: <http://www.nist.gov/srm>

Emergency Telephone ChemTrec:
1-800-424-9300 (North America)
+1-703-527-3887 (International)

2. HAZARDS IDENTIFICATION

Classification

Physical Hazard:	Not classified.	
Health Hazard:	Acute Toxicity, Oral	Category 4
	Skin Corrosion/Irritation	Category 1C
	Eye Damage/Eye Irritation	Category 1

Label Elements

Symbol



Signal Word

DANGER

Hazard Statement(s):

H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.

Precautionary Statement(s):

P260	Do not breathe dust.
P264	Wash hands thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P280	Wear protective gloves, protective clothing, and eye protection.

P301+P330+P331	If swallowed: Rinse mouth. Do not induce vomiting.
P303+P361+P353	If on skin (or hair): Remove all contaminated clothing. Rinse skin with water.

P305+P351+P338	If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P363	Wash contaminated clothing before reuse.
P308+P313	If exposed or concerned: Get medical attention.
P405	Store locked up.
P501	Dispose of contents and container according to local regulations.

Hazards Not Otherwise Classified: Not applicable.

Ingredients(s) with Unknown Acute Toxicity: Not applicable.

3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Substance: Oxalic acid

Other Designations: Dicarboxylic acid; ethanedioic acid; oxalic acid dihydrate

Components are listed in compliance with OSHA's 29 CFR 1910.1200.

Hazardous Component(s)	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
Oxalic acid	144-62-7	205-634-3	100

4. FIRST AID MEASURES

Description of First Aid Measures:

Inhalation: If adverse effects occur, remove to uncontaminated area. If not breathing, give artificial respiration or oxygen by qualified personnel. Seek immediate medical attention.

Skin Contact: Wash skin with soap and water for at least 15 minutes. Thoroughly clean and dry contaminated clothing before reuse.

Eye Contact: Flush eyes with water for at least 15 minutes. If necessary, seek medical attention.

Ingestion: Never make an unconscious person vomit or drink fluids. Give milk. If vomiting occurs, keep head lower than hips to help prevent aspiration. If person is unconscious, turn head to side. Get medical attention immediately.

Most Important Symptoms/Effects, Acute and Delayed: Burns to the eyes, skin, respiratory tracts, and digestive tracts and kidney damage.

Indication of any immediate medical attention and special treatment needed, if necessary: If any of the above symptoms are present, seek medical attention if needed.

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Slight fire hazard. Dust/air mixtures may ignite or explode. See Section 9, "Physical and Chemical Properties" for flammability properties.

Extinguishing Media:

Suitable: Alcohol-resistant foam, carbon dioxide, regular dry chemical, and fine water spray.

Unsuitable: None listed.

Specific Hazards Arising from the Chemical: None listed.

Special Protective Equipment and Precautions for Fire-Fighters: Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH approved self-contained breathing apparatus (SCBA).

NFPA Ratings (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health = 3 Fire = 1 Reactivity = 0

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures: Keep unnecessary people away, isolate hazard area and deny entry. Use suitable protective equipment; see Section 8, "Exposure Controls and Personal Protection".

Methods and Materials for Containment and Clean up: Do not touch spilled material. Notify safety personnel of spill and evacuate all nonessential personnel. Avoid generating dust. Collect spilled material in appropriate container for disposal. Keep out of water supplies and sewers.

7. HANDLING AND STORAGE

Safe Handling Precautions: See Section 8, "Exposure Controls and Personal Protection".

Storage: Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits:

OSHA (PEL):	1 mg/m ³ (TWA)
NIOSH (REL):	1 mg/m ³ (TWA)
	2 mg/m ³ (STEL)
	500 mg/m ³ (IDLH)
ACGIH (TLV):	1 mg/m ³ (TWA)
	2 mg/m ³ (STEL)

Engineering Controls: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Personal Protection: In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate Personal Protective Equipment (PPE) to minimize exposure to this material.

Respiratory Protection: If workplace conditions warrant a respirator, a respiratory protection program that meets OSHA 29CFR 1910.134 must be followed. Refer to NIOSH 42 CFR 84 for applicable certified respirators.

Eye/Face Protection: Wear splash resistant safety goggles with a face shield. An eye wash station should be readily available near areas of use.

Skin and Body Protection: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Chemical-resistant gloves should be worn at all times when handling chemicals.

9. PHYSICAL AND CHEMICAL PROPERTIES

Descriptive Properties

Appearance
(physical state, color, etc.):
Molecular Formula:
Molar Mass (g/mol):
Odor:
Odor threshold:
pH:
Evaporation rate:
Melting point/freezing point (°C):
Relative Density
as Specific Gravity (water=1):
Vapor Pressure (mmHg):
Vapor Density (air = 1):
Viscosity (cP):
Solubility(ies):

Partition coefficient (n-octanol/water):
Particle Size:

Oxalic acid

colorless to white, hygroscopic
powder
C2H2O4
90.04
odorless
not available
1.3 (0.1 M)
not applicable
not available
1.9 at 17 °C
<0.001 at 20 °C
not applicable
not applicable
soluble in water (10 %), alcohol,
and glycerol;
insoluble in benzene, chloroform,
and petroleum ether
not available
not available

Thermal Stability Properties

Autoignition Temperature (°C):	not available
Thermal Decomposition (°C):	190 (374 °F) Sublimation
Initial boiling point and boiling range:	not available
Explosive Limits, LEL (Volume %):	not available
Explosive Limits, UEL (Volume %):	not available
Flash Point (°C):	not available
Flammability (solid, gas):	not available

10. STABILITY AND REACTIVITY

Reactivity: Stable at normal temperatures and pressure.

Stability: X Stable Unstable

Possible Hazardous Reactions: Dangerous gases may accumulate in confined spaces.

Conditions to Avoid: Avoid heat, flames, sparks and other sources of ignition. May ignite or explode on contact with combustible materials.

Incompatible Materials: Bases, combustible materials, and oxidizing materials.

Fire/Explosion Information: See Section 5, "Fire Fighting Measures".

Hazardous Decomposition: Thermal decomposition will produce organic acids, oxides of carbon and formic acid.

Hazardous Polymerization: Will Occur X Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Exposure: X Inhalation X Skin X Ingestion

Symptoms Related to the Physical, Chemical and Toxicological Characteristics: Burns to the eyes, skin, respiratory and digestive tracts and kidney damage.

Potential Health Effects (Acute, Chronic and Delayed):

Inhalation: Acute exposure to dust or vapors may result in irritation and ulceration of the upper respiratory tract accompanied by nose bleeds, coughing, shortness of breath and prostration. Some symptoms may be delayed. Chronic or repeated exposure may result in chronic inflammation of the upper respiratory tract.

Skin Contact: Acute exposure to the solid or solution may cause severe irritation or burns accompanied by redness, tingling, pain and blisters. Repeated exposure may cause dermatitis.

Eye Contact: Acute exposure to the solid or solution may cause irritation or burns, possibly severe. The severity depends on the concentration and duration of contact. Repeated or chronic exposure, depending on the concentration, may result in conjunctivitis or burns.

Ingestion: Concentrated doses of oxalic acid (solid or solution) may cause severe irritation of the mucous membranes of the digestive tract, accompanied by an immediate sour or bitter taste, a burning sensation, epigastric pain, difficulty swallowing, nausea, vomiting blood, diarrhea, bloody stools and dehydration. Systemic effects may include shock, hypotension, hypocalcemia, collapse, and convulsions. Pathological findings show damage to the kidneys.

Numerical Measures of Toxicity

Acute Toxicity: Category 4, Oral

Rat Oral LD50: 375 mg/kg

Rat Dermal LD50: 20 000 mg/kg

Skin Corrosion/Irritation: Category 1C

Rabbit Skin: 500 mg (24 h) mild

Serious Eye Damage/Eye Irritation: Category 1

Rabbit Eyes: 250 ug (24 h) - severe; 100 mg (4 s) - severe

Respiratory Sensitization: Not classified; no data available.

Skin Sensitization: Not classified; no data available.

Germ Cell Mutagenicity: Not classified; no data available.

Carcinogenicity: Not classified.

Listed as a Carcinogen/Potential Carcinogen _____ Yes _____ X No

Oxalic acid is not listed by NTP, IARC or OSHA as a carcinogen/potential carcinogen.

Reproductive Toxicity: Not classified.

Mouse Oral TDLo: 275 mg/kg (Multigeneration)

Specific Target Organ Toxicity, Single Exposure: Not classified; no data available.

Specific Target Organ Toxicity, Repeated Exposure: Not classified; no data available.

Aspiration Hazard: Not classified; no data available.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data: Invertebrate, water flea (*Daphnia magna*) EC50 [static]: 125 mg/L to 150 mg/L (48 h)

Persistence and Degradability: No data available.

Bioaccumulative Potential: No bioaccumulation expected.

Mobility in Soil: No data available.

Other Adverse effects: No data available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose of waste in accordance with all applicable federal, state, and local regulations.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: UN3261, corrosive solid, acidic, organic, n.o.s. (oxalic acid), Hazard Class 8, Packing Group III.

15. REGULATORY INFORMATION

U.S. Regulations:

CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated.

SARA Title III Section 302 (40 CFR 355.30): Not regulated.

SARA Title III Section 304 (40 CFR 355.40): Not regulated.

SARA Title III Section 313 (40 CFR 372.65): Not regulated.

OSHA Process Safety (29 CFR 1910.119): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE HEALTH: Yes.

CHRONIC HEALTH: Yes.

FIRE: No.

REACTIVE: No.

PRESSURE: No.

State Regulations:

California Proposition 65: Not listed.

U.S. TSCA Inventory: Listed.

TSCA 12(b), Export Notification: Section 4, 1 % de minimus concentration.

Canadian Regulations:

WHMIS Information: Not provided for this material.

16. OTHER INFORMATION

Issue Date: 27 February 2015

Sources: ChemAdvisor, Inc., SDS *Oxalic acid*, 10 September 2014.

CDC; NIOSH; *NIOSH Pocket Guide to Chemical Hazards*; Department of Health and Human Services (DHHS), Centers for Disease Control and Prevention (CDC), National Institute for Safety and Health; *Oxalic acid*, 18 November 2010; available at <http://www.cdc.gov/niosh/npg/npgd0474.html> (accessed Feb 2015); see also *Oxalic Acid*, RTECS#: RO2450000, CAS#: 144-62-7; available at <http://www.cdc.gov/niosh-rtecs/RO256250.html> (accessed Feb 2015).

Hazardous Substances Data Bank (HSDB), National Library of Medicine's TOXNET system, *Oxalic Acid CAS No. 144-62-7*; available at <http://toxnet.nlm.nih.gov> (accessed Feb 2015).

U.S. Environmental Protection Agency, Office of Prevention, Pesticides And Toxic Substances; *R.E.D. FACTS Oxalic Acid*; December 1992; available at <http://www.epa.gov/oppsrrd1/REDs/factsheets/4070fact.pdf> (accessed Feb 2015).

CAMEO Chemicals, Office of Response and Restoration, NOAA's Ocean Service, National Oceanic and Atmospheric Administration (NOAA); *Oxalic Acid CAS#: 144-62-7 and CHRIS Code OXA*; available at <http://www.cdc.gov/niosh-rtecs/RO256250.html> (accessed Feb 2015).

Key of Acronyms:

ACGIH	American Conference of Governmental Industrial Hygienists	NRC	Nuclear Regulatory Commission
ALI	Annual Limit on Intake	NTP	National Toxicology Program
CAS	Chemical Abstracts Service	OSHA	Occupational Safety and Health Administration
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	PEL	Permissible Exposure Limit
CFR	Code of Federal Regulations	RCRA	Resource Conservation and Recovery Act
DOT	Department of Transportation	REL	Recommended Exposure Limit
EC50	Effective Concentration, 50 %	RM	Reference Material
EINECS	European Inventory of Existing Commercial Chemical Substances	RQ	Reportable Quantity
EPCRA	Emergency Planning and Community Right-to-Know Act	RTECS	Registry of Toxic Effects of Chemical Substances
IARC	International Agency for Research on Cancer	SARA	Superfund Amendments and Reauthorization Act
IATA	International Air Transportation Agency	SCBA	Self-Contained Breathing Apparatus
IDLH	Immediately Dangerous to Life and Health	SRM	Standard Reference Material
LC50	Lethal Concentration, 50 %	STEL	Short Term Exposure Limit
LD50	Lethal Dose, 50 %	TLV	Threshold Limit Value
LEL	Lower Explosive Limit	TPQ	Threshold Planning Quantity
MSDS	Material Safety Data Sheet	TSCA	Toxic Substances Control Act
NFPA	National Fire Protection Association	TWA	Time Weighted Average
NIOSH	National Institute for Occupational Safety and Health	UEL	Upper Explosive Limit
NIST	National Institute of Standards and Technology	WHMIS	Workplace Hazardous Materials Information System

Disclaimer: Physical and chemical data contained in this SDS are provided only for use in assessing the hazardous nature of the material. The SDS was prepared carefully, using current references; however, NIST does not certify the data in the SDS. The certified values for this material are given in the NIST Certificate.

Users of this SRM should ensure that the SDS in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail srmmsds@nist.gov; or via the Internet at <http://www.nist.gov/srm>.