

## CLIP, Chemical Laboratory Information Profile

"Only when you know the hazards, can you take the necessary precautionary measures."

## Citric Acid



CAS No.: 77-92-9

Synonyms: 2-hydroxy-1,2,3-propanetricarboxylic acid,  $\beta$ -hydroxytricarballic acid

## Physical Properties

Weakly acidic, colorless to white crystalline solid.  
 Vapor pressure at 20 °C: negligible  
 Melting point: 153 °C  
 Boiling point: decomposes

## Exposure Limits

OSHA PEL: NE  
 ACGIH TLV: NE

## Hazardous Characteristics

Overall toxicity	Flammability	Destructive to skin/eye	Absorbed through skin	Sensitizer?	Self-reactive?	Incompatible with:
0	1	1	0	0	0	Strong bases, oxidizing agents.*

0: None (or very low); 1: Slight; 2: Moderate; 3: High; 4: Severe.

## \*Reactivity Hazards

Similar to other combustible substances, citric acid reacts with oxidizing agents: the stronger the agent, the greater the vigor of the reaction. See Bretherick's *Handbook of Reactive Chemical Hazards* for details and for other incompatibilities.

Cited as known to be or reasonably

anticipated to be carcinogenic in NTP-9?

No

Identified as a reproductive toxin in Frazier and Hage,

*Reproductive Hazards of the Workplace?*

No

## Typical symptoms of acute exposures:

Irritating if in eyes or on skin, coughing if inhaled, sore throat or abdominal pain if gram quantities are ingested.

Ingestion of approximately 0.5 kg or more can be fatal; in the blood, citric acid precipitates as calcium citrate and the consequent severe reduction of the concentration of ionic calcium in the plasma induces cardiac arrhythmias.

## Principal target organ(s) or system(s):

Eyes, skin, respiratory system.

## Storage Requirements

Store with other chemicals in a cool, dry, well-ventilated general storage location.

## Additional Remarks

Citric acid is used as a flavoring agent in some foods. As noted above, calcium citrate is only very slightly soluble in aqueous media. The frequent, regular, and consistent ingestion of small amounts of citric acid can be inimical to the development and maintenance of the skeletal system. Note that the information in the CLIP also applies to citric acid monohydrate, CAS No. 5949-29-1.

## Notes

## ReadMe

This Chemical Laboratory Information Profile is *not* a Material Safety Data Sheet. It is a brief summary for teachers and their students that describes some of the hazards of this chemical as it is typically used in laboratories. On the basis of your knowledge of these hazards and before using or handling this chemical, *you need to select the precautions and first-aid procedures to be followed*. For that information as well as for other useful information, refer to Material Safety Data Sheets, container labels, and references in the scientific literature that pertain to this chemical.

## Reproductive Toxins

Some substances that in fact are reproductive toxins are not yet recognized as such. For the best readily available and up-to-date information, refer to "DART/ETIC". See the TOXNET home page at <http://www.sis.nlm.nih.gov> and click on "Toxicology search".

*Note that some of the data in DART/ETIC have not been peer-reviewed.* See also Linda M. Frazier and Marvin L. Hage, *Reproductive Hazards of the Workplace*; Wiley, 1998; and T. H. Shepard, *Catalog of Teratogenic Agents*, 9th ed.; Johns Hopkins University Press, 1998.

## Abbreviations

ACGIH TLV—American Conference of Governmental Industrial Hygienists—Threshold Limit Value. C—Ceiling. CAS—Chemical Abstracts Service. mg/m<sup>3</sup>—milligrams per cubic meter. NA—Not applicable. NE—Not established. NI—No information. NTP-9—National Toxicology Program, Ninth Annual Report on Carcinogens. OSHA PEL—Occupational Safety and Health Administration—Permissible Exposure Limit. ppm—parts per million. STEL/C—Short-term exposure limit and ceiling.

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