

## Product Information

### DL-Lactic acid

Product Number **L 1250**  
Store at Room Temperature

#### Product Description

Molecular Formula: C<sub>3</sub>H<sub>6</sub>O<sub>3</sub>  
Molecular Weight: 90.08  
CAS Number: 50-21-5<sup>1</sup>  
Melting point: 28-33 °C<sup>2</sup>  
Boiling point: 122 °C<sup>2</sup>  
pK<sub>a</sub>: 3.73<sup>2</sup>, 3.79<sup>3</sup> (25 °C, L-(+)-isomer).  
Specific gravity: 1.249 (15 °C)<sup>2</sup>  
Synonyms: Milk acid, 2-Hydroxypropionic acid<sup>4</sup>,  
r-Lactic acid<sup>5</sup>

This product is an approximately 85% (w/w) DL-lactic acid solution, containing equal amounts of D- and L-isomers. This product is a viscous liquid (syrup) with a molarity of 11.3 M, based on a density of 1.2 g/ml, a concentration of 85% (w:w) and a molecular weight of 90.08.

It has been shown that lactic acid derived from muscle glycogen can be converted into liver glycogen, which can in turn be converted into blood glucose. D-lactate was utilized four times more slowly than L-lactate, but both isomers are absorbed at the same rate from the intestine.<sup>5</sup>

In bacterial fermentations of milk, the lactose present in milk is hydrolyzed to glucose and galactose, and then fermented to L-, D- or DL-lactic acid. Lactic acid and casein form a curd at pH 4.6 (the isoelectric point of casein); this is important in cheese production. Certain strains of bacteria such as *Lactobacillus*, *Streptococcus*, *Lactococcus*, and *Leuconostoc* may metabolize lactic acid.<sup>6</sup>

Lactic acid is used as a reagent in organic synthesis (in the manufacture of adhesives). It is used in the leather, textile, and tanning industries.

It may be used as a plasticizer, a catalyst, or an acidifying agent. Lactic acid has even been used as a flavoring agent in the manufacture of tobacco products.<sup>7</sup>

To titrate this material, the solution can first be titrated with 1-2 N sodium hydroxide to a phenolphthalein endpoint at room temperature. However, this does not hydrolyze the lactic anhydride. The solution must be heated to boiling and the titration must be completed at this temperature.<sup>8</sup>

#### Precautions and Disclaimer

For Laboratory Use Only. Not for drug, household or other uses.

#### Preparation Instructions

This product is miscible with water (10%, v/v), yielding a clear, colorless to very faint yellow solution.

#### References

1. CAS Number 598-82-3, which has also been used for this compound, is retired. See [www.cas.org](http://www.cas.org).
2. Data for Biochemical Research, 3rd ed., Dawson, R. M. C., et al., Oxford University Press (New York, NY: 1986), pp. 44-45.
3. The Merck Index, 12th ed., Entry# 5350.
4. <http://www.cdc.gov/niosh/rtecs/od2ab980.html>
5. Cori, C.F., and Cori, G.T., Glycogen Formation in the Liver from *d*- and *l*-Lactic Acid. *J. Biol. Chem.*, **81**, 389-403 (1929).
6. <http://www.ftns.wau.nl/micr/AppIMolGen/Chapter%2005%20Food%20Biotechnology.pdf>
7. [http://tobaccodocuments.org/profiles/additives/lactic\\_acid.html](http://tobaccodocuments.org/profiles/additives/lactic_acid.html)
8. *Biochem. Prep.*, **8**, 75-79 (1961).

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