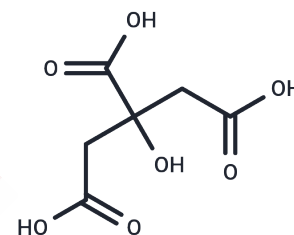


## Citric acid

### Chemical Properties

CAS No. :	77-92-9
Formula:	C <sub>6</sub> H <sub>8</sub> O <sub>7</sub>
Molecular Weight:	192.12
Storage:	Powder: -20°C for 3 years   In solvent: -80°C for 1 year Actual storage temperature shall be subject to the COA.



### Biological Description

Description	Citric acid (Citro) is a weak organic tricarboxylic acid found in citrus fruits. Citric acid is a food additive and a natural preservative.
Targets(IC50)	Apoptosis,Endogenous Metabolite,Antibacterial,Antibiotic
In vitro	<p><b>METHODS:</b> HaCaT cells were treated with Citric acid (0-12.5 mM) for 24 hours, and the percentage of viable cells was determined by flow cytometry.</p> <p><b>RESULTS:</b> Citric acid exhibited anti-proliferative activity in a dose-dependent manner. [1]</p> <p><b>METHODS:</b> HaCaT cells were treated with Citric acid (12.5 mM) for 48 hours, and the levels of related proteins were detected by western blot.</p> <p><b>RESULTS:</b> Citric acid increased the expressions of FAS, BAX, BID, AIF, EndoG, cytochrome C, PARP, GADD153, GRP78 and Caspase-3, -8, -9, and decreased the expressions of BCL-2 and BCL-XL. [1]</p>
In vivo	<p><b>METHODS:</b> To study the effect of Citric acid on the liver of mice, Citric acid (120, 240, and 480 mg/kg) was intraperitoneally injected into mice.</p> <p><b>RESULTS:</b> Citric acid significantly reduced the activity of GSH-Px in the liver of mice, induced an increase in the level of MDA (malondialdehyde), and increased the activity of caspase-3 to induce apoptosis in a dose-dependent manner. [2]</p> <p><b>METHODS:</b> To study the nephrotoxicity of Citric acid, Citric acid (120, 240, and 480 mg/kg) was intraperitoneally injected into mice every week for 3 consecutive weeks.</p> <p><b>RESULTS:</b> Citric acid causes nephrotoxicity in mice. [3]</p>

### Solubility Information

Solubility	H <sub>2</sub> O: 100 mg/mL (520.51 mM),Sonication is recommended. DMSO: 240 mg/mL (1249.22 mM),Sonication is recommended. (< 1 mg/ml refers to the product slightly soluble or insoluble)
In vivo Formulation	10% DMSO+40% PEG300+5% Tween 80+45% Saline: 5 mg/mL (26.03 mM),Sonication is recommended. <i>Please add the solvents sequentially, clarifying the solution as much as possible before adding the next one. Dissolve by heating and/or sonication if necessary. Working solution is recommended to be prepared and used immediately. The formulation provided above is for reference purposes only. In vivo formulations may vary and should be modified based on specific experimental conditions.</i>

### Preparing Stock Solutions

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	1mg	5mg	10mg
1 mM	5.2051 mL	26.0254 mL	52.0508 mL
5 mM	1.041 mL	5.2051 mL	10.4102 mL
10 mM	0.5205 mL	2.6025 mL	5.2051 mL
50 mM	0.1041 mL	0.5205 mL	1.041 mL

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Please select the appropriate solvent to prepare the stock solution, according to the solubility of the product in different solvents. Please use it as soon as possible.

Note: The dilution table applies only to solid products. For liquid products, please calculate the stock solution based on the stated concentration and/or density.

### Reference

Ying TH, et al. Citric acid induces cell-cycle arrest and apoptosis of human immortalized keratinocyte cell line (HaCaT) via caspase- and mitochondrial-dependent signaling pathways. *Anticancer Res.* 2013 Oct;33(10):4411-20.

Chen X, et al. Study on injury effect of food additive citric acid on liver tissue in mice. *Cytotechnology.* 2014 Mar;66(2):275-82.

Chen X, et al. Effects of the food additive, citric acid, on kidney cells of mice. *Biotech Histochem.* 2015 Jan;90(1):38-44.

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