

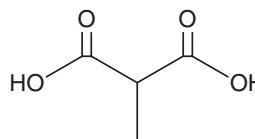
PRODUCT INFORMATION



Methylmalonic Acid

Item No. 14885

CAS Registry No.: 516-05-2
Formal Name: 2-methyl-propanedioic acid
Synonyms: Isosuccinic Acid, Methylmalonate, MMA, NSC 25201
MF: C₄H₆O₄
FW: 118.1
Purity: ≥95%
Supplied as: A crystalline solid
Storage: Room temperature
Stability: ≥4 years



Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Laboratory Procedures

Methylmalonic acid is supplied as a crystalline solid. A stock solution may be made by dissolving the methylmalonic acid in the solvent of choice. Methylmalonic acid is soluble in organic solvents such as ethanol, DMSO, and dimethyl formamide (DMF), which should be purged with an inert gas. The solubility of methylmalonic acid in ethanol is approximately 25 mg/ml and approximately 30 mg/ml in DMSO and DMF.

Further dilutions of the stock solution into aqueous buffers or isotonic saline should be made prior to performing biological experiments. Ensure that the residual amount of organic solvent is insignificant, since organic solvents may have physiological effects at low concentrations. Organic solvent-free aqueous solutions of methylmalonic acid can be prepared by directly dissolving the crystalline solid in aqueous buffers. The solubility of methylmalonic acid in PBS, pH 7.2, is approximately 10 mg/ml. We do not recommend storing the aqueous solution for more than one day.

Description

Methylmalonic acid is a dicarboxylic acid and byproduct of propionate catabolism.¹ It impairs mitochondrial respiration, increases glucose consumption, and downregulates the transcription of the mature neuronal markers neuron-specific enolase (ENO2) and synaptophysin (SYP) in neuronally differentiated SH-SY5Y cells. Intrastratial administration of methylmalonic acid (100 mg/ml) induces neuronal loss in rats.² Methylmalonic acid accumulates in the tissues and body fluids of patients with methylmalonic acidemia, an inborn error of metabolism characterized by a deficiency in the activity of L-methylmalonyl-CoA mutase or its cofactor 5-deoxyadenosylcobalamin and leads to seizures, intellectual disabilities, psychomotor abnormalities, and coma.¹

References

1. da Costa, R.T., Dos Santos, M.B., Silva, I.C.S., *et al.* Methylmalonic acid compromises respiration and reduces the expression of differentiation markers of SH-SY5Y human neuroblastoma cells. *ACS Chem. Neurosci.* **12**(14), 2608-2618 (2021).
2. Narasimhan, P., Sklar, R., Murrell, M., *et al.* Methylmalonyl-CoA mutase induction by cerebral ischemia and neurotoxicity of the mitochondrial toxin methylmalonic acid. *J. Neurosci.* **16**(22), 7336-7346 (1996).

WARNING

THIS PRODUCT IS FOR RESEARCH ONLY - NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

SAFETY DATA

This material should be considered hazardous until further information becomes available. Do not ingest, inhale, get in eyes, on skin, or on clothing. Wash thoroughly after handling. Before use, the user must review the complete Safety Data Sheet, which has been sent via email to your institution.

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