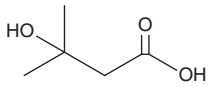
PRODUCT INFORMATION

β-Hydroxyisovaleric Acid

Item No. 34030

CAS Registry No.: 625-08-1
Formal Name: 3-hydroxy-3-methyl-butanoic acid
Synonyms: β-Hydroxy-β-methylbutyric Acid, 3-Hydroxyisovaleric Acid
MF: $C_5H_{10}O_3$
FW: 118.1
Purity: ≥98%
Supplied as: A liquid
Storage: -20°C
Stability: ≥2 years



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

Laboratory Procedures

β-Hydroxyisovaleric acid is supplied as a liquid. A stock solution may be made by dissolving the β-hydroxyisovaleric acid in the solvent of choice, which should be purged with an inert gas. β-Hydroxyisovaleric acid is soluble in organic solvents such as ethanol, DMSO, and dimethyl formamide. The solubility of β-hydroxyisovaleric acid in these solvents is approximately 10 mg/ml.

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 β-hydroxyisovaleric acid can be prepared by directly dissolving the liquid in aqueous buffers. The solubility of β-hydroxyisovaleric 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

β-Hydroxyisovaleric acid is an active metabolite of L-leucine.[1] It is produced from leucine *via* an α-ketoisocaproic acid intermediate by α-ketoisocaproate oxidase in human liver homogenates. β-Hydroxyisovaleric acid (50 µM) reduces increases in 20S proteasome activity and NF-κB nuclear accumulation induced by proteolysis-inducing factor (PIF) in C2C12 myotubes.[2] It inhibits protein degradation and stimulates protein synthesis in the gastrocnemius muscle of cachectic mice bearing MAC16 tumors when administered at doses of 0.25 and 2.5 g/kg.[3] Urinary levels of β-hydroxyisovaleric acid are increased in patients with type II diabetes.[4] Formulations containing β-hydroxyisovaleric acid have been used as dietary supplements.

References

1. Sabourin, P.J. and Bieber, L.L. Formation of *β*-hydroxyisovalerate by an *α*-ketoisocaproate oxygenase in human liver. *Metabolism* **32(2)**, 160-164 (1983).
2. Smith, H.J., Wyke, S.M., and Tisdale, M.J. Mechanism of the attenuation of proteolysis-inducing factor stimulated protein degradation in muscle by β-hydroxy-β-methylbutyrate. *Cancer Res.* **64(23)**, 8731-8735 (2004).
3. Smith, H.J., Mukerji, P., and M.J., T. Attenuation of proteasome-induced proteolysis in skeletal muscle by β-hydroxy-β-methylbutyrate in cancer-induced muscle loss. *Cancer Res.* **65(1)**, 277-283 (2005).
4. Yu, W.M., Kuhara, T., Inoue, Y., *et al.* Increased urinary excretion of *β*-hydroxyisovaleric acid in ketotic and non-ketotic type II diabetes mellitus. *Clin. Chim. Acta* **188(2)**, 161-168 (1990).

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