

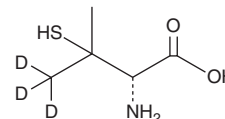
PRODUCT INFORMATION



Penicillamine-d₃

Item No. 33797

CAS Registry No.: 2925655-01-0
Formal Name: 3-mercapto-D-valine-4,4,4-d₃
Synonyms: D-Penicillamine-d₃, β-Thiovaline-d₃
MF: C₅H₈D₃NO₂S
FW: 152.2
Chemical Purity: ≥95% (Penicillamine)
Deuterium Incorporation: ≥99% deuterated forms (d₁-d₃); ≤1% d₀
Supplied as: A solid
Storage: -20°C
Stability: ≥4 years



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

Laboratory Procedures

Penicillamine-d₃ is intended for use as an internal standard for the quantification of penicillamine (Item No. 23955) by GC- or LC-MS. The accuracy of the sample weight in this vial is between 5% over and 2% under the amount shown on the vial. If better precision is required, the deuterated standard should be quantitated against a more precisely weighed unlabeled standard by constructing a standard curve of peak intensity ratios (deuterated *versus* unlabeled).

Penicillamine-d₃ is supplied as a solid. A stock solution may be made by dissolving the penicillamine-d₃ in the solvent of choice, which should be purged with an inert gas. Penicillamine-d₃ is soluble in water.

Description

Penicillamine is an orally bioavailable copper chelator and penicillin degradation product.^{1,2} It increases urinary and fecal copper excretion and decreases liver copper concentration in a rat model of copper overload when administered at 0.67 mmol/kg per day, but does not affect kidney, spleen, or brain copper levels.³ Penicillamine (100 mg/kg per day) dissolves copper-rich granules in hepatic lysosomes of Long-Evans cinnamon (LEC) rats, which spontaneously develop hepatic injury and acute hepatitis and have a mutation homologous to that of the human Wilson disease gene.⁴ Penicillamine has anticonvulsant and proconvulsant effects in mice when administered at 0.5 and 250 mg/kg, respectively, which are blocked by the nitric oxide synthase (NOS) inhibitors L-NAME (Item No. 80210) and 7-nitroindazole (Item No. 81340).⁵ Formulations containing penicillamine have been used to treat Wilson disease, cystinuria, and active rheumatoid arthritis.

References

1. Delangle, P. and Mintz, E. Chelation therapy in Wilson's disease: From D-penicillamine to the design of selective bioinspired intracellular Cu(I) chelators. *Dalton Trans.* **41(21)**, 6359-6370 (2012).
2. Abraham, E.P., Chain, E., Baker, W., *et al.* Penicillamine, a characteristic degradation product of penicillin. *Nature* **151(3821)**, 107 (1943).
3. Domingo, J.L., Gómez, M., and Jones, M.M. Comparative efficacy of several potential treatments for copper mobilization in copper-overloaded rats. *Biol. Trace Elem. Res.* **74(2)**, 127-139 (2000).
4. Klein, D., Lichtmannegger, J., Heinzmann, U., *et al.* Dissolution of copper-rich granules in hepatic lysosomes by D-penicillamine prevents the development of fulminant hepatitis in Long-Evans cinnamon rats. *J. Hepatol.* **32(2)**, 193-201 (2000).
5. Rahimi, N., Sadeghzadeh, M., Javad-Paydar, M., *et al.* Effects of D-penicillamine on pentylenetetrazole-induced seizures in mice: involvement of nitric oxide/NMDA pathways. *Epilepsy Behav.* **39**, 42-47 (2014).

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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CAYMAN CHEMICAL

1180 EAST ELLSWORTH RD
ANN ARBOR, MI 48108 · USA

PHONE: [800] 364-9897
[734] 971-3335

FAX: [734] 971-3640

CUSTSERV@CAYMANCHEM.COM
WWW.CAYMANCHEM.COM