

PRODUCT DATA SHEET

Conduritol B Epoxide

Catalog number: 1889

Synonyms: Inhibits *beta*-glucosidase activity;
Inhibits *alpha*-glucosidase activity;
specific inhibitor of
glucocerebrosidase in cultured
cells; 1,2-Anhydro-*myo*-inositol;
CBE

Source: synthetic

Solubility: water, DMSO, methanol (slightly)

CAS number: 6090-95-5

Molecular Formula: C₆H₁₀O₅

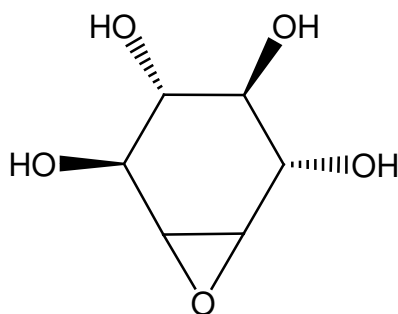
Molecular Weight: 162

Storage: -20°C

Purity: TLC: >98%; identity confirmed by MS

TLC System: chloroform/methanol (70:30)

Appearance: solid



Application Notes:

Conduritol B epoxide (CBE) is a derivative of the naturally occurring conduritol B and is a catalytic, site-directed, covalent inhibitor of acid *beta*-glucosidase¹ and of *alpha*-glucosidase.² Conduritol B epoxide binds covalently and irreversibly to the catalytic site of acid *beta*-glucosidase, which is the enzyme responsible for the conversion of glucosylceramide to ceramide.³ Gaucher disease, the most prevalent lysosomal storage disease, is caused by mutations in the gene encoding acid *beta*-glucosidase resulting in a defect in the enzyme *beta*-glucosidase activity and a subsequent accumulation of glucosylceramide. Conduritol B epoxide can be used to rapidly reproduce the effects of Gaucher disease making it ideal for studies of this condition.⁴ Treatment with CBE results in glucocerebrosides accumulating in neurons, causing changes in axonal morphology, although CBE has no effect on dendrite development. Co-incubation with CBE and inhibitors of sphingolipid synthesis such as fumonisins B1, an inhibitor of acylation of sphingoid long-chain bases, antagonizes the effects of CBE.⁵

Selected References:

1. G. Grabowski et al. "Gaucher disease types 1, 2, and 3: differential mutations of the acid *beta*-glucosidase active site identified with conduritol B epoxide derivatives and sphingosine" *Am J Hum Genet.*, Vol. 37 pp. 499-510, 1985
2. S. Yang et al. "Inactivation of *alpha*-glucosidase by the active-site-directed inhibitor, conduritol B epoxide" *Biochim Biophys Acta*, Vol. 828(3) pp. 236-240, 1985
3. L. Premkumar et al. "X-ray Structure of Human Acid-*beta*-Glucosidase Covalently Bound to Conduritol-B-Epoxide Implications for Gaucher Disease" *The Journal of Biological Chemistry*, Vol. 280(25) pp. 23815-23819, 2005
4. G. Grabowski et al. "Human acid *beta*-glucosidase. Use of conduritol B epoxide derivatives to investigate the catalytically active normal and Gaucher disease enzymes" *The Journal of Biological Chemistry*, Vol. 261(18) pp. 8263-8269, 1986
5. E. Korkotian et al. "Elevation of Intracellular Glucosylceramide Levels Results in an Increase in Endoplasmic Reticulum Density and in Functional Calcium Stores in Cultured Neurons" *The Journal of Biological Chemistry*, Vol. 274(31) pp. 21673-21678, 1999

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