

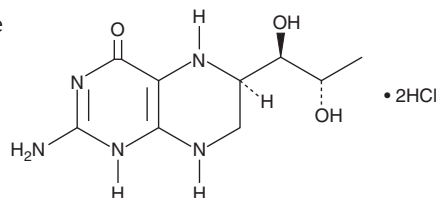
PRODUCT INFORMATION



(6R)-5,6,7,8-tetrahydro-L-Biopterin (hydrochloride)

Item No. 81880

CAS Registry No.: 69056-38-8
Formal Name: 2-amino-6R-(1R,2S-dihydroxypropyl)-5,6,7,8-tetrahydro-4(3H)-pteridinone, dihydrochloride
Synonym: BH₄
MF: C₉H₁₅N₅O₃ • 2HCl
FW: 314.2
Purity: ≥99%
UV/Vis.: λ_{max}: 220, 268 nm
Supplied as: A crystalline 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

(6R)-5,6,7,8-tetrahydro-L-Biopterin (BH₄) (hydrochloride) is supplied as a crystalline solid. A stock solution may be made by dissolving the BH₄ (hydrochloride) in the solvent of choice, which should be purged with an inert gas. BH₄ (hydrochloride) is soluble in organic solvents such as DMSO and dimethyl formamide. The solubility of BH₄ (hydrochloride) in these solvents is approximately 5 and 3 mg/ml, respectively.

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 BH₄ (hydrochloride) can be prepared by directly dissolving the crystalline solid in aqueous buffers. The solubility of BH₄ (hydrochloride) in PBS (pH 7.2) is approximately 10 mg/ml. We do not recommend storing the aqueous solution for more than one day.

Description

BH₄ is a cofactor that, in the presence of enzyme site iron, binds to phenylalanine hydroxylase, tryptophan or tyrosine hydroxylase, and nitric oxide synthase (NOS), to facilitate the production of aromatic amino acids, neurotransmitters, and nitric oxide (NO), respectively.^{1,2,3} It is formed *de novo* from GTP with GTP cyclohydrolase-1 (GCH1) catalyzing the rate limiting conversion of GTP to 7,8-dihydroneopterin (NH₂TTP) followed by subsequent processing by TS and SPR to convert NH₂TTP to BH₄.^{3,4} BH₄ acts as a radical-trapping antioxidant that inhibits phospholipid oxidation in lipid membranes.⁴ It inhibits IKE- or RSL3-induced ferroptosis in HT-1080 cells (EC₅₀s = 21 and 69 μM), as well as ferroptosis induced by knockout of glutathione peroxidase (Gpx4^{-/-}) in immortalized mouse fibroblasts.³ BH₄ also reduces RLS3-induced lipid peroxidation in murine fibroblasts and HT-1080 cells when used at a concentration of 50 μM.

References

1. Kappock, T.J. and Caradonna, J.P. Pterin-dependent amino acid hydroxylases. *Chem. Rev.* **96(7)**, 2659-2756 (1996).
2. Mayer, B. and Werner, E.R. In search of a function for tetrahydrobiopterin in the biosynthesis of nitric oxide. *N.-S. Arch. Pharmacol.* **351(5)**, 453-463 (1995).
3. Kraft, V.A.N., Bezjian, C.T., Pfeiffer, S., *et al.* GTP cyclohydrolase 1/tetrahydrobiopterin counteract ferroptosis through lipid remodeling. *ACS Cent. Sci.* **6(1)**, 41-53 (2020).
4. Soula, M., Weber, R.A., Zilka, O., *et al.* Metabolic determinants of cancer cell sensitivity to canonical ferroptosis inducers. *Nat. Chem. Biol.* **16(12)**, 1351-1360 (2020).

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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