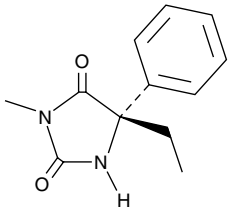
Product Information

(S)-Mephenytoin

Item No. 11913

CAS Registry No.: 70989-04-7
Formal Name: (5S)-5-ethyl-3-methyl-5-phenyl-2,4-imidazolidinedione
Synonym: (S)-5-Ethyl-3-methyl-5-phenylhydantoin
MF: $C_{12}H_{14}N_2O_2$
FW: 218.3
Purity: ≥98%
Stability: ≥2 years at -20°C
Supplied as: A crystalline solid



Laboratory Procedures

For long term storage, we suggest that (S)-mephenytoin be stored as supplied at -20°C. It should be stable for at least two years.

(S)-Mephenytoin is supplied as a crystalline solid. A stock solution may be made by dissolving the (S)-mephenytoin in the solvent of choice. (S)-Mephenytoin is soluble in organic solvents such as ethanol, DMSO, and dimethyl formamide (DMF), which should be purged with an inert gas. The solubility of (S)-mephenytoin in ethanol is approximately 16 mg/ml and approximately 25 mg/ml in DMSO and DMF.

(S)-Mephenytoin is sparingly soluble in aqueous buffers. For maximum solubility in aqueous buffers, (S)-mephenytoin should first be dissolved in DMSO and then diluted with the aqueous buffer of choice. (S)-Mephenytoin has a solubility of approximately 0.5 mg/ml in a 1:1 solution of DMSO:PBS (pH 7.2) using this method. We do not recommend storing the aqueous solution for more than one day.

(S)-Mephenytoin is a substrate of the cytochrome P450 (CYP) isoform CYP2C19, also known as mephenytoin 4-hydroxylase.[1] CYP2C19 metabolizes a variety of therapeutic agents, including omeprazole, proguanil, diazepam, propranolol, citalopram, imipramine, and certain barbiturates.[2] Genetic defects in CYP2C19 result in poor metabolism of these compounds, and (S)-mephenytoin can be used to screen for such mutations by assaying its metabolites in urine.[2-4] (S)-Mephenytoin has anticonvulsant activities.[5]

References

1. Shimada, T., Misono, K.S., and Guengerich, F.P. Human liver microsomal cytochrome P-450 mephenytoin 4-hydroxylase, a prototype of genetic polymorphism in oxidative drug metabolism. *J. Biol. Chem.* **261(2)**, 909-921 (1986).
2. Ferguson, R.J., de Morais, S.M., Benhamou, S., *et al.* A new genetic defect in human CYP2C19: Mutation of the initiation codon is responsible for poor metabolism of S-mephenytoin. *J. Pharmacol. Exp. Ther.* **284(1)**, 356-361 (1998).
3. Ozawa, S., Soyama, A., Saeki, M., *et al.* Ethnic differences in genetic polymorphisms of CYP2D6, CYP2C19, CYP3As and MDR1/ABCB1. *Drug Metab. Pharmacokinet.* **19(2)**, 83-95 (2004).
4. Guttendorf, R.J., Britto, M., Blouin, R.A., *et al.* Rapid screening for polymorphisms in dextromethorphan and mephenytoin metabolism. *Br. J. Clin. Pharmacol.* **29(4)**, 373-380 (1990).
5. Wong, P.T.H., Tan, S.-F., and Lee, H.-S. N-demethylation of methyl and dimethyl derivatives of phenytoin and their anticonvulsant activities in mice. *Jpn. J. Pharmacol.* **48(4)**, 473-478 (1988).

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