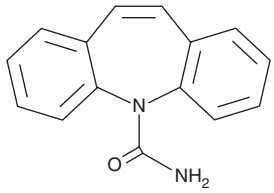
PRODUCT INFORMATION

Carbamazepine

Item No. 15422

CAS Registry No.:	298-46-4
Formal Name:	5H-dibenz[b,f]azepine-5-carboxamide
Synonyms:	CBZ, NSC 169864
MF:	$C_{15}H_{12}N_2O$
FW:	236.3
Purity:	≥98%
UV/Vis.:	λ_{max}: 214, 238, 285 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

Carbamazepine is supplied as a crystalline solid. A stock solution may be made by dissolving the carbamazepine in the solvent of choice, which should be purged with an inert gas. Carbamazepine is soluble in organic solvents such as ethanol, DMSO, and dimethyl formamide (DMF). The solubility of carbamazepine in ethanol is approximately 3 mg/ml and approximately DMSO in DMF and 25 mg/ml.

Carbamazepine is sparingly soluble in aqueous buffers. For maximum solubility in aqueous buffers, carbamazepine should first be dissolved in DMSO and then diluted with the aqueous buffer of choice. Carbamazepine 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.

Description

Carbamazepine is an inhibitor of sodium channels.[1] It preferentially inhibits inactivated voltage-gated sodium channel $Na_v1.7$ and $Na_v1.3$ (IC_{50}s = 406 and 900 µM, respectively) over resting (closed) $Na_v1.7$ and $Na_v1.3$ channels in whole-cell patch-clamp assays using HEK293 cells (IC_{50}s = 1,584 and 2,464 µM, respectively). Carbamazepine (100 µM) inhibits sodium currents in a rat sciatic nerve patch-clamp assay *ex vivo*.[2] It reduces levels of the endogenous catecholamine dopamine in the striatum and hippocampus, as well as the levels of the dopamine precursor L-DOPA (Item No. 13248) in the striatum, in rats when administered at a dose of 100 mg/kg.[3] Dietary administration of carbamazepine (0.5% w/w) reduces amphetamine-induced hyperactivity in mice.[4] It decreases immobility time in the forced swim test in mice when administered in the diet at 0.75% w/w. Formulations containing carbamazepine have been used in the treatment of seizures, trigeminal neuralgia, and bipolar disorder.

References

1. Sheets, P.L., Heers, C., Stoehr, T., *et al.* Differential block of sensory neuronal voltage-gated sodium channels by lacosamide [(2R)-2-(acetylamino)-N-benzyl-3-methoxypropanamide], lidocaine, and carbamazepine. *J. Pharmacol. Exp. Ther.* **326(1)**, 89-99 (2008).
2. Schwarz, J.R. and Grigat, G. Phenytoin and carbamazepine: Potential- and frequency-dependent block of Na currents in mammalian myelinated nerve fibers. *Epilepsia* **30(3)**, 286-294 (1989).
3. Okada, M., Hirano, T., Mizuno, K., *et al.* Biphasic effects of carbamazepine on the dopaminergic system in rat striatum and hippocampus. *Epilepsy Res.* **28(2)**, 143-153 (1997).
4. Kara, N.Z., Karpel, O., Toker, L., *et al.* Chronic oral carbamazepine treatment elicits mood-stabilising effects in mice. *Acta Neuropsychiatr.* **26(1)**, 29-34 (2014).

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