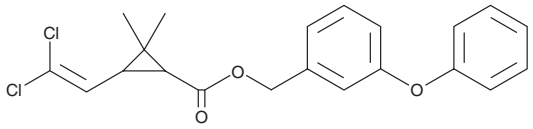
PRODUCT INFORMATION

Permethrin

Item No. 23821

CAS Registry No.: 52645-53-1
Formal Name: 3-(2,2-dichloroethenyl)-2,2-dimethyl-cyclopropanecarboxylic acid, (3-phenoxyphenyl)methyl ester
MF: $C_{21}H_{20}Cl_2O_3$
FW: 391.3
Purity: ≥95% (mixture of isomers)
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

Permethrin is supplied as a crystalline solid. A stock solution may be made by dissolving the permethrin in the solvent of choice. Permethrin is soluble in organic solvents such as ethanol, DMSO, and dimethyl formamide, which should be purged with an inert gas. The solubility of permethrin in these solvents is approximately 14, 16, and 33 mg/ml, respectively.

Description

Permethrin is a modulator of voltage-gated sodium channels (Na_V) that is used as an insecticide.[1] It delays channel deactivation of the $Na_V1.8$ channel expressed in *X. laevis* oocytes. It is at least 100-fold more potent at insect than mammalian sodium channels, leading to slow deactivation of *D. para*/TipE, but not rat brain IIA or β1, sodium channels expressed in *X. laevis* oocytes when used at a concentration of 500 nM.[2] Permethrin (5 µM) increases sodium influx in BV-2 and primary microglial cells by approximately 28 and 29%, respectively, and activates microglia.[3] Long-term application of permethrin leads to dose- and time-dependent intracellular sodium accumulation and TNF-α release in microglia *in vitro*. Formulations containing permethrin have been used for the treatment of head lice and scabies infestations.

References

1. Choi, J.S. and Soderlund, D.M. Structure-activity relationships for the action of 11 pyrethroid insecticides on rat Na_v 1.8 sodium channels expressed in *Xenopus oocytes*. *Toxicol. Appl. Pharmacol.* **211(3)**, 233-244 (2006).
2. Warmke, J.W., Reenan, R.A., Wang, P., *et al*. Functional expression of *Drosophila para* sodium channels. Modulation by the membrane protein TipE and toxin pharmacology. *J. Gen. Physiol.* **110(2)**, 119-133 (1997).
3. Hossain, M.M., Liu, J., and Richardson, J.R. Pyrethroid insecticides directly activate microglia through interaction with voltage-gated sodium channels. *Toxicol. Sci.* **155(1)**, 112-123 (2017).

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