

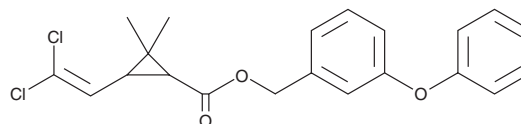
# PRODUCT INFORMATION



## Permethrin

Item No. 23821

**CAS Registry No.:** 52645-53-1  
**Formal Name:** 3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropanecarboxylic acid, (3-phenoxyphenyl)methyl ester  
**MF:** C<sub>21</sub>H<sub>20</sub>Cl<sub>2</sub>O<sub>3</sub>  
**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<sub>v</sub>) that is used as an insecticide.<sup>1</sup> It delays channel deactivation of the Na<sub>v</sub>1.8 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.<sup>2</sup> Permethrin (5 μM) increases sodium influx in BV-2 and primary microglial cells by approximately 28 and 29%, respectively, and activates microglia.<sup>3</sup> 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<sub>v</sub> 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).

#### 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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