

Product Data Sheet

Product Name: Chlorpyrifos-oxon

Cat. No.: GC70769

Chemical Properties

Cas. No. 5598-15-2

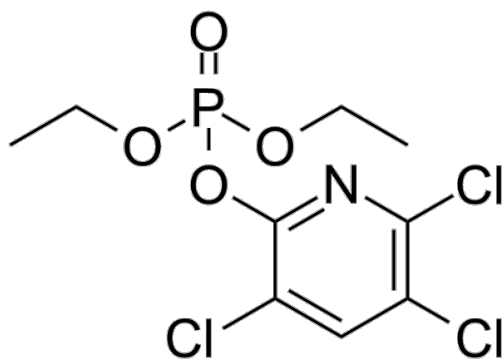
Formula $C_9H_{11}Cl_3NO_4P$ M.Wt 334.52

Solubility DMSO : 100 mg/mL (298.94 mM; Storage -20°C, stored under nitrogen
Need ultrasonic; Hygroscopic DMSO
has a significant impact on the
solubility of product, please use
newly opened DMSO)

General tips For obtaining a higher solubility , please warm the tube at 37 °C and shake it in the
ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution : ship with blue ice All other available size: ship with RT , or
blue ice upon request.

Structure



Background

Chlorpyrifos-oxon, an active metabolite of Chlorpyrifos, is a potent phosphorylating agent that potently inhibits AChE. Chlorpyrifos-oxon can induce cross-linking between subunits of tubulin and disrupt microtubule function.

Caution: Product has not been fully validated for medical applications. For research use only.

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Treatment of tubulin with 1.5 mM Chlorpyrifos-oxon (CPO) leads to protein aggregation. However, even at 1.5 μ M Chlorpyrifos-oxon cross-linked trimers are apparent. Chlorpyrifos-oxon promotes isopeptide bond cross-linking of tubulin monomers to make multimers^[2].

In PC12 cells in culture, 24 hours of exposure to Chlorpyrifos at a concentration 10-fold below the concentration that inhibits AChE activity (3.0 μ M) impaired neurite outgrowth while Chlorpyrifos-oxon inhibits neurite outgrowth at 1.0 nM^[3].

Chlorpyrifos-oxon (CPO) is rapidly detoxified by human liver microsomes via CYP-dependent deethylation and dearylation, and by glutathione-S-transferase. In addition, reactions with A-esterases such as paraoxonase 1 (PON 1) or B-esterases such as carboxylesterase and butyrylcholinesterase (BChE) in the liver may rapidly degrade or scavenge Chlorpyrifos-oxon^[1]. Chlorpyrifos-oxon (3 mg/kg, ip; once; wild-type mice) treatment shows the dimensions of microtubules from Chlorpyrifos-oxon-treated mice are about 60% of those from control mice. The microtubules from mice exposed to Chlorpyrifos-oxon have covalently modified amino acids and abnormal structure, suggesting disruption of microtubule function^[4].

References:

- [1]. Florian Eyer, et al. Extreme variability in the formation of chlorpyrifos oxon (CPO) in patients poisoned by chlorpyrifos (CPF). *Biochem Pharmacol.* 2009 Sep 1;78(5):531-7.
- [2]. Lawrence M Schopfer, et al. Chlorpyrifos oxon promotes tubulin aggregation via isopeptide cross-linking between diethoxyphospho-Lys and Glu or Asp: Implications for neurotoxicity. *J Biol Chem.* 2018 Aug 31;293(35):13566-13577.
- [3]. Jie Gao, et al. Chlorpyrifos and chlorpyrifos oxon impair the transport of membrane bound organelles in rat cortical axons. *Neurotoxicology.* 2017 Sep;62:111-123.
- [4]. Wei Jiang, et al. Mice treated with chlorpyrifos or chlorpyrifos oxon have organophosphorylated tubulin in the brain and disrupted microtubule structures, suggesting a role for tubulin in neurotoxicity associated with exposure to organophosphorus agents.

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