TDCPP

Cat. No.: HY-108712

CAS No.: 13674-87-8

Molecular Formula: $C_9H_{15}Cl_6O_4P$

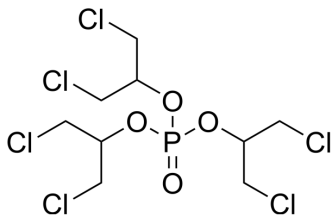
Molecular Weight: 430.9

Target: Others

Pathway: Others

Storage:

Pure form	-20°C	3 years
	4°C	2 years
In solvent	-80°C	6 months
	-20°C	1 month



SOLVENT & SOLUBILITY

In Vitro

Ethanol : 100 mg/mL (232.07 mM; Need ultrasonic)

DMSO : ≥ 62.5 mg/mL (145.05 mM)

* "≥" means soluble, but saturation unknown.

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	2.3207 mL	11.6036 mL	23.2072 mL
5 mM	0.4641 mL	2.3207 mL	4.6414 mL
10 mM	0.2321 mL	1.1604 mL	2.3207 mL

Please refer to the solubility information to select the appropriate solvent.

In Vivo

1. Add each solvent one by one: 15% Cremophor EL >> 85% Saline
   Solubility: 33.33 mg/mL (77.35 mM); Suspended solution; Need ultrasonic
2. Add each solvent one by one: 50% PEG300 >> 50% saline
   Solubility: 33.33 mg/mL (77.35 mM); Suspended solution; Need ultrasonic
3. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.08 mg/mL (4.83 mM); Clear solution
4. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.08 mg/mL (4.83 mM); Clear solution
5. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.08 mg/mL (4.83 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

TDCPP is a chlorinated analog of tris(2,3-dibromopropyl)phosphate (Tris) which is one of the most detected

	organophosphorus flame retardants (OPFRs) in the environment.
In Vitro	Exposure to TDCPP does not significantly affect cell viability until at concentration >68 μg/mL. HCECs show a 16% cell viability loss after exposing to 136 μg/mL TDCPP. Moreover, TDCPP induces a sharp decrease in viable cells (87%) after exposing to ≥272 μg/mL TDCPP. Based on cell viability, the LC_{50} value for TDCPP is 202 μg/mL using a nonlinear regression. Compare to controls, TDCPP-exposed cells exhibit a concentration-dependent increase in apoptosis. Anti-apoptotic Bcl-2 protein expression is increased to 1.4 fold after exposing to 2 μg/mL TDCPP, 1.2-folds at 20 μg/mL but dynamically decreased to 0.4 fold at 200 μg/mL compare to control. The caspase-3 activity is increased to 2.1 folds of the control at 200 μg/mL TDCPP[1]. TDCPP inhibits cell growth at lower concentrations (IC_{50} of 27 μM), while cell viability and toxicity are affected at higher concentrations (IC_{50} of 171 μM and 168 μM, respectively)[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Kinase Assay [1]	The cellular ATP contents are determined in HCECs grown in DMEM containing 0, 2, 20, or 200 μg/mL TDCPP using a luciferase-based ATP assay kit according to the manufacturer's guideline. Briefly, after 24 h exposure, HCECs are lysed with lysis buffer. Lysates are then centrifuged at 12,000 g at 4°C for 5 min. Then, 100 μL of supernatant is mixed with 100 μL ATP detection working dilution. Luminance is examined by an fluorescence microplate reader[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
Cell Assay [1]	To examine the effects of TDCPP on cell viability, HCECs are planted into 96-well plate (100 μL/well) at density of 1×10^5 cells/mL overnight. Then, the medium is changed into fresh medium containing 0.034, 0.34, 3.4, 34, 68, 136, 272, or 340 μg/mL of TDCPP and solvent vehicle (0.1%, v/v) and incubated for 24 h. Cell viability is detected using CCK-8 cell viability assay kit according to the manufacturer's instructions. After exposure, cellular morphology is observed and recorded by an inverted microscopy[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- J Hazard Mater. 2022 Jul 15;434:128824.
- Chemosphere. 2022 Sep 7;136345.
- Gene. 2022 Feb 17;822:146349.

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REFERENCES

[1]. Xiang P, et al. Effects of organophosphorus flame retardant TDCPP on normal human corneal epithelial cells: Implications for human health. Environ Pollut. 2017 Nov;230:22-30.

[2]. Killilea DW, et al. Flame retardant tris(1,3-dichloro-2-propyl)phosphate (TDCPP) toxicity is attenuated by N-acetylcysteine in human kidney cells. Toxicol Rep. 2017 May 17;4:260-264.

Tel: 609-228-6898 Fax: 609-228-5909 E-mail: tech@MedChemExpress.com
Address: 1 Deer Park Dr, Suite Q, Monmouth Junction, NJ 08852, USA