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TCEP hydrochloride

Cat. No.: HY-W011500

CAS No.: 51805-45-9

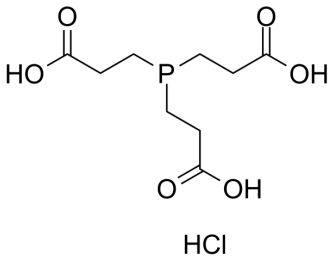
Molecular Formula: $C_9H_{16}ClO_6P$

Molecular Weight: 286.65

Target: Others

Pathway: Others

Storage: 4°C, protect from light, stored under nitrogen
* In solvent : -80°C, 6 months; -20°C, 1 month (protect from light, stored under nitrogen)



SOLVENT & SOLUBILITY

In Vitro

DMSO : 100 mg/mL (348.86 mM; Need ultrasonic)
H_2O : 50 mg/mL (174.43 mM; ultrasonic and adjust pH to 7 with NaOH)

Preparing Stock Solutions	Mass / Solvent / Concentration	1 mg	5 mg	10 mg
	1 mM	3.4886 mL	17.4429 mL	34.8857 mL
	5 mM	0.6977 mL	3.4886 mL	6.9771 mL
	10 mM	0.3489 mL	1.7443 mL	3.4886 mL

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

In Vivo

1. Add each solvent one by one: PBS
Solubility: 100 mg/mL (348.86 mM); Clear solution; Need ultrasonic

BIOLOGICAL ACTIVITY

Description

TCEP hydrochloride (Tris(2-carboxyethyl)phosphine hydrochloride) is a non-thiol reducing agent that is more stable and produces a faster S-S reductive reaction than other chemical reductants. TCEP hydrochloride is a trialkylphosphine, selectively reduces protein disuldes without altering the properties or interacting with thiol-directed agents in the reaction mixture. TCEP hydrochloride is also a commonly used reducing agent in the DNA/AuNP chemistry[1][2][3][4].

In Vitro

TCEP hydrochloride has been introduced which oers the prospect of serving as an alternative to the more commonly employed DTT in the NF-κB-DNA binding reactions in vitro, using recombinant p50 protein and a ^{32}P-labelled κB oligonucleotide. DTT promotes NF-κB-DNA binding in concentrations from 0.25 to 2.6 mM in binding reactions. However, in the presence of 0.25 mM DTT, inhibition of NF-κB binding is seen only at Hg^{2+} concentrations greater than 100 μM and results are highly variable. In contrast, TCEP hydrochloride promotes NF-κB-DNA binding in a dose-related manner in concentrations from 0.25 to 6 mM. In the presence of even 6 mM TCEP hydrochloride, Hg^{2+} prevents NF-κB-DNA binding at concentrations as low as 20 μM in binding reactions[1].

	The human lactoferrin (hLF) peptide is dissolved in phosphate buffer to a concentration of 0.1 mm. Reduction of the disulfide bonds is obtained by adding a 30-fold molar excess of TCEP hydrochloride with subsequent incubation for 2 h at 37 [2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Mol Cell. 2023 Nov 20:S1097-2765(23)00914-0.
- Acta Biomater. 2023 Dec 8:S1742-7061(23)00710-9.
- Cell Biosci. 2022 Dec 21;12(1):206.
- Int J Mol Sci. 2023 Dec 18;24(24):17631.

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REFERENCES

[1]. Han JC, Han GY. A procedure for quantitative determination of tris(2-carboxyethyl)phosphine, an odorless reducing agent more stable and effective than dithiothreitol. Anal Biochem. 1994;220(1):5-10.

[2]. Dieguez-Acuña FJ, et al. Inhibition of NF-kappaB-DNA binding by mercuric ion: utility of the non-thiol reductant, tris(2-carboxyethyl)phosphine hydrochloride (TCEP), on detection of impaired NF-kappaB-DNA binding by thiol-directed agents. Toxicol In Vitro. 2000 Feb;14(1):7-16.

[3]. Duchardt F, et al. A cell-penetrating peptide derived from human lactoferrin with conformation-dependent uptake efficiency. J Biol Chem. 2009 Dec 25;284(52):36099-108.

[4]. Sequeira MA, et al. Modulating amyloid fibrillation in a minimalist model peptide by intermolecular disulfide chemical reduction. Phys Chem Chem Phys. 2019 Jun 5;21(22):11916-11923.

[5]. Wu R, et al. Effects of Small Molecules on DNA Adsorption by Gold Nanoparticles and a Case Study of Tris(2-carboxyethyl)phosphine (TCEP). Langmuir. 2019 Oct 15;35(41):13461-13468.

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