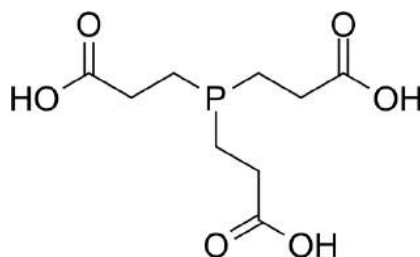


## TCEP (hydrochloride)

#Cat: NB-45-00029-1g      size: 1g

#Cat: NB-45-00029-10g      size: 10g



HCl

### 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 disulfides 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<sup>[1][2][3][4]</sup>.

### Product Information

**Chemical Name:** Propanoic acid, 3,3',3''-phosphinidynetris-, hydrochloride (1:1)

#### 1. Physical And Chemical Properties

**Batch Molecular Formula:** C<sub>9</sub>H<sub>15</sub>O<sub>6</sub>P · HCl

**Batch Molecular Weight:** 286.65

**CAS No.:** [51805-45-9]

**Physical Appearance:** White to light yellow (Solid)

**Purity:** >98%

**Melting Point:** 173° C

**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 and solubility

DMSO : 100 mg/mL (348.86 mM; Need ultrasonic)

H<sub>2</sub>O : 50 mg/mL (174.43 mM; ultrasonic and adjust pH to 7 with NaOH)

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	Solvent Concentration	Mass	1 mg	5 mg	10 mg
		Preparing Stock Solutions	1 mM	3.4886 mL	17.4429 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.

## Biological activity

In vitro:

TCEP hydrochloride has been introduced which opens the prospect of serving as an alternative to the more commonly employed DTT in the NF- $\kappa$ B-DNA binding reactions in vitro, using recombinant p50 protein and a <sup>32</sup>P-labelled  $\kappa$ B oligonucleotide. DTT promotes NF- $\kappa$ B-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- $\kappa$ B binding is seen only at Hg<sup>2+</sup> concentrations greater than 100  $\mu$ M and results are highly variable. In contrast, TCEP hydrochloride promotes NF- $\kappa$ B-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<sup>2+</sup> prevents NF- $\kappa$ B-DNA binding at concentrations as low as 20  $\mu$ M 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°C [2].

## References

- [1]. Dieguez-Acuña FJ, et al. Inhibition of NF- $\kappa$ B-DNA binding by mercuric ion: utility of the non-thiol reductant, tris(2-carboxyethyl)phosphine hydrochloride (TCEP), on detection of impaired NF- $\kappa$ B-DNA binding by thiol-directed agents. *Toxicol In Vitro*. 2000 Feb;14(1):7-16.
- [2]. 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.
- [3]. 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.
- [4]. 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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