Soltec Ventures
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# TCEP HCl

M115 Tris( 2-carboxyethyl)phosphine hydrochloride CAS # *[ 51805-45-9 ]*

| amt | price |
|---|---|
| 1gm | $22 |
| 2gm | $30 |
| 5gm | $52 |
| 10gm | $95 |
| 25gm | $230 |
| 100gm | $900 |

## Introduction

TCEP is a potent versatile odorless thiol-free reducing agent with many applications in protein chemistry and proteomic research centered in the quantitative ease of reducing disulfide bonds. The versatile compound is readily soluble and very stable in aqueous solutions. In fact TCEP is stable in aqueous, acidic and basic solutions. TCEP reduces disulfide bonds as effectively as dithiothreitol ( DTT ), but unlike dithiothreitol ( DTT ) and other thiol reducing agents, it does not need to be removed prior to certain sulfhydryl reactive cross linking reactions. These are but a few of the reasons TCEP is a superior reagent than dithiothreitol ( DTT ) for use in reducing disulfide bonds in protein chemistry and proteomic research.

The ability of trialkylphosphines to reduce disulfide bonds have been known for many years. This class of compounds are stable in aqueous solution, selectively reduce disulfide bonds and are essentially non reactive toward other functional groups commonly found in proteins. The widespread use of trialkylphosphine reducing agents in protein research was hindered due to their poor solubility in water and their disagreeable odor. These obstacles were eliminated with the discovery of TCEP.

TCEP selectively and quantitatively reduces even the most water soluble resistive alkyl disulfides over a wide pH range. Reductions typically require less than 5 minutes and are conducted at room temperature. TCEP is odorless and unlike other reducing agents stable to air oxidation. Compared to dithiothreitol ( DTT ) TCEP is more stable, more effective and is easily the reagent of choice for most researchers.

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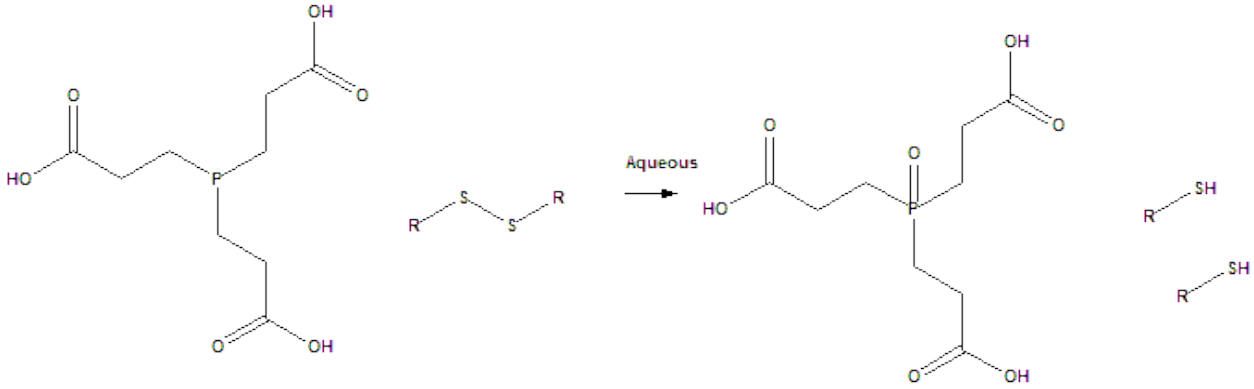
Reduction of organic disulfide bonds with TCEP




## Product Information

**Solubility Details**

The TCEP hydrochloride salt (m.w. 286.64) has a solubility of 310gm/liter (1.08 Molar) in water. Being hydrophilic TCEP is generally very soluble in aqueous buffers at nearly any pH. Therefore working concentrations and 10X stock solutions may be readily prepared in most aqueous buffers. TCEP has only minimal solubility in organic solvents including methanol and ethanol.

**Stability in Solution**

TCEP is stable in aqueous acidic and basic solutions. When TCEP is dissolved directly in water the resulting pH is 2.5. Various buffers may be used for the reductions. Studies indicate that no change in concentration occurs after 24 hour incubation at room temperature in 100mM HCL, 100mM NaOH, or any of the following 50mM buffers Tris HCl (pH7.5,8.5,9.5), HEPES(pH 6.8,8.2), borate(pH 8.2,10.2), and CAPS pH9.7,11.1). Even after weeks in these buffers, less than 20% of the TCEP was oxidized.

**Effective pH for Reduction**

TCEP effectively and quantitatively reduces disulfide bonds over a broad pH range. TCEP completely reduced 2,2'-dithiodipyridine (2,2'-DTDP) within 30 seconds at pH 1.5<pH<9.0. Indeed this reduction is used as an analytical assay check for TCEP purity. Please call our technical service crew for a detailed procedure techservice@soltecventures.com. Above pH 9.0 only 50% reduction occurred. TCEP is more effective and is superior to DTT at pH<8.0. TCEP will even reduce DTT.

**Working Concentration**

For most applications 5-50mM TCEP provides sufficient molar excess to effectively and quantitatively reduce peptide or protein sulfide bonds within a few minutes. Researchers have found that when molar equivalents are used, reductions can take up to an hour at room temperature.

**Compatibility**

TCEP does not contain thiols and does not have to be removed from solutions before performing reactions involving maleimide labeling or other cross linking reagents. TCEP concentrations of <10-20 mM are compatible with most maleimide reaction chemistry.

**TCEP References:**

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