**1,10-PHENANTHROLINE MONOHYDRATE**  
(ACS Reagent)

**Product Number** P 9375  
**Storage Temperature** RT

**CAS #:** 5144-89-8  
**Synonyms:** o-phenanthroline; 4,5-phenanthroline

**Product Description**

1,10-Phenanthroline monohydrate is a white powder with melting point 93-94°C. It has a shelf-life of two years if stored dry; Sigma packages it under inert gas to protect it from moisture and adsorption of carbon dioxide from the air. It is reported to have a λ\text{max} = 265 nm with an extinction coefficient EmM = 31.5 (solvent not stated).

1,10-Phenanthroline forms a complex with ferrous (iron II, Fe\(^{2+}\)) ion; it can be used as an indicator in oxidation-reduction systems, in titrating ferrous salts. The product forms a complex with Fe\(^{2+}\), but not with Fe\(^{3+}\). NH\(_2\)OH can be added to the solution to reduce the Fe\(^{3+}\) to Fe\(^{2+}\) for analysis of iron. The complex between iron (II) and 1,10-phenanthroline can be quantitated by its absorption at 510 nm. The ACS reagent P1294 is tested for suitability as a redox indicator and suitability for determining iron. The compound also chelates other metal ions, and has been used to remove or bind metals in metallo-enzymes, inhibiting their activity. The effective concentration to use as a metallo-protease inhibitor or metal-activated proteases inhibitor is 1-10 mM. Due to the product’s strong UV absorbance, it may interfere with spectrophotometric assays.

**Preparation Instructions**

The product is reported to be soluble one part in about 300 parts water, 70 parts benzene; soluble in alcohol or acetone. It is tested at Sigma at 100 mg/ml in ethanol, giving a clear solution. A stock solution in ethanol or methanol (200 mM) is stable for months at -20°C. A diluted aqueous solution is stable for days.

**References**

2. Sigma Procedure or data.  

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