

Persulfate - Ferric Thiocyanate Method

Version 5 / May 2023

Applications and Industries

Groundwater remediation, pools and spas

References

D.F. Boltz and J.A. Howell, eds., Colorimetric Determination of Nonmetals, 2nd ed., Vol. 8, page 304 (1978)

Chemistry

In an acidic solution, persulfate oxidizes ferrous iron. The resulting ferric ion reacts with ammonium thiocyanate to form ferric thiocyanate, a red-orange colored complex, in direct proportion to the persulfate concentration. Results are expressed as ppm (mg/L) sodium persulfate ($\text{Na}_2\text{S}_2\text{O}_8$).

Available Analysis Systems

Visual colorimetric: CHEMetrics®

Instrumental colorimetric: Persulfate instrumental analysis can be performed with Hydrogen Peroxide Vacu-vials® test kit, Cat. No. K-5543, using a modified test procedure described in the Test Method section of K-5543 kit instructions.

Storage Requirements

Products should be stored in the dark and at room temperature.

Shelf Life

When stored in the dark and at room temperature:

Visual colorimetric:

CHEMetrics refill, color comparators: at least 1 year

Safety Information

Safety Data Sheets (SDS) are available upon request and at www.chemetrics.com. Read SDS before using these products. Breaking the tip of an ampoule in air rather than water may cause the glass ampoule to shatter. Wear safety glasses and protective gloves.

Interference Information

- Ferric iron and hydrogen peroxide interfere positively if present at any level.
- Peracetic acid (PAA) interferes positively.
- Cupric copper at concentrations of 0.1 ppm and above causes an increasing negative interference as the kit reagents age.
- Free chlorine up to 40 ppm and ozone up to at least 1 ppm do not develop color (i.e. do not cause a false positive result) with this chemistry.
- Monochloramine up to at least 10 ppm does not interfere.
- Oxidized manganese (permanganate, Mn^{7+}) interferes positively.
- Sample pHs between 1 and 8 are tolerated. Samples with extreme pHs or that are highly buffered should be adjusted to pHs of approximately 4-7 prior to analysis.
- Colored or turbid samples may make a visual color match difficult.

Accuracy Statement

Statements of accuracy are based on laboratory tests performed under ideal testing conditions using standards of known concentration prepared in deionized water.

CHEMetrics kit: ± 1 color standard increment