



IRON DETERMINATION WITH 3-HYDOXY-3-METHYL-1-P-METHOXY PHENYL TRIAZENE

Manojkumar S. Chhangani

Department of Chemistry, Government Meera Girls' College, Udaipur (Raj.)-313001, India

dr.mksc@gmail.com

3-Hydroxy-3-methyl-1-p-methoxy phenyl triazene has been established as a new reagent for spectrophotometric determination of Iron.

3-Hydroxy-3-methyl-1-p-methoxy phenyl triazene has been prepared (m.p. 102°C) by coupling methyl hydroxylamine with diazonium salt in 1:1 molar proportion at 0-50°C. The reagent solution was prepared in ethanol. The standard solution of iron was prepared by dissolving requisite quantity of A.R. grade ferric nitrate nonahydrate in double distilled water. To prevent hydrolysis a few drop of concentrated nitric acid were added to the solution. The solution was then standardized with EDTA using sulphosalicylic acid as an indicator. A systronics UV-VIS spectrophotometer-108 was used for spectrophotometric work and for pH-measurements systronics pH meter-324 was used.

The green Fe(III) complex was soluble in ethanol and its color was stable for more than 24 h. It gives maximum absorbance at 730 nm therefore subsequent absorbance were made at 730 nm against solvent blank. Six fold excess of the reagent was used and pH was kept between 2.0 to 3.0. The system obeys Beer's law in the range from 13.96 ppm to 27.92 ppm of iron. Sandell's sensitivity is 43.93 ng/cm² and molar absorptivity is 1,270 liter/mole cm. The Job's method, Slope ratio method and mole ratio methods- (i) Yoe & Jones and (ii) Zolotov's gave 1:3 (Fe:R) stoichiometry for the complex.

Interference of 26 diverse ions was studied in determination of 13.90 ppm of iron. Na(I), K(I), Ba(II), NH₄⁺, Cl⁻, Br⁻ and SO₄⁻ did not interfere when present in 100 ppm concentration. In addition to these ions, Mn(II), Ni(II), Cd(II), I⁻ and CO₃⁻ did not interfere when present in -10 ppm.

The precision study was carried for 13.96 ppm of Fe(III), standard deviation was 0.096 ppm of iron. The solid complex was obtained as blue micro crystal, m.p. 147°C with molecular formula Fe(C₈H₁₀N₃O₂)₃. This molecular formula corroborates the composition of the complex found with solution studies