

Abstract

A highly sensitive and selective spectrophotometric method is developed for the determination of iron(III) in aqueous solution with hydroxytriazenes. In this work, the effect of pH variation, the composition of the complex of Fe³⁺ to hydroxytriazenes, precision, Sandell's sensitivity and interference studies were investigated. This investigation was done under the optimum reaction conditions and other important analytical parameters. Hydroxytriazenes reacts with the Fe³⁺ and forms coloured complexes. The Fe(III) complex is detected at $\lambda_{\text{max}} = 410$ nm and pH range 3-4 for reagent no(i), 530 nm and 4-5 for reagent no (ii), 410 nm and 4.5 -5.5 for reagent (iii), 396 nm and 3.5-5.0 for reagent (iv), 467 nm and 2.5-3.5 for reagent no.(vi). Beer-Lambert's law is obeyed in the concentration range $(1.0-5.0) \times 10^{-5}$ M, $(1.5-9.0) \times 10^{-5}$ M, $(0.5-4.0) \times 10^{-5}$ M, $(0.3-1.8) \times 10^{-5}$ M, $(0.6-3.6) \times 10^{-5}$ M, $(2-12) \times 10^{-5}$ M for nos. (i), (ii), (iii), (iv), (v), (vi) respectively. The molar ratio of Fe(III) to the hydroxytriazenes was found as 1:3. The limiting concentration for interference for 35 diverse ions are reported. The standard deviation ranges between 0.019 to 0.088. The Sandell's sensitivity in ng/cm³ ranges between 2.5.579 to 4.189. Reagent nos. (iii), (iv), (v), which were very sensitive were used to determine the level of iron in vegetable samples from Baharini, Nakuru Town and the results obtained were compared with those of atomic absorption spectrophotometer.