

NOTES

Spectrophotometric Determination of U (IV) with N-(O Sulphonic Benzoyl Sodium Salt)-N-Phenylhydroxylamine

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N-(O-Sulphonic benzoyl sodium salt)-N-Phenylhydroxylamine has been proposed by the reaction of equimolar amounts of sulphobenzoic anhydride and phenylhydroxylamine in benzene¹⁻². A solution (2% w/v) of this reagent in distilled water was proposed fresh each time. A solution of uranium was prepared by fusing uranium dioxide with potassium pyrosulphate and diluting the mixture with sulphuric acid. Uranium content was estimated with 8-hydroxy quinoline³.

All chemicals used were of reagent grade. A backmann model DU-quartz spectrophotometer was used for absorbance measurements and a cambridge bench type pH meter for pH measurements.

The green water insoluble complex formed as a result of interaction of U (IV) with above reagent shows maximum absorbance at 450 nm. The complex was found to be stable for 12 hrs. The absorbance of the complex measured at 450 nm remains constant in the pH range 5.6 to 9.8.

The system obeys Beer's law up to 5.6 ppm uranium. The sensitivity of the reaction is $0.0028 \mu\text{g U (IV) cm}^{-1}$ for .001 absorbance. The molar absorptivity is 17,140. The slope ratio method⁴ and jobs method⁵ suggest that a 1 : 2 (metal-ligand) complex is formed in the system. The amounts of foreign ions (in ppm) tolerated in the estimation of 1.34 ppm of U(IV) at pH 6.6 are as follows. 260 ppm of Zn(II) and Mn(II); 180 ppm of alkali and alkaline earth metals; 100 ppm of Ir(III) and Cr(III); 90 ppm of Sb(III), Pb(II) and Sn(II), Cu(II), Al(III) and Fe(III) are precipitated at pH 6.6 and may be removed by centrifugation.

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