

NOTE

Spectrophotometric Investigations of Platinum(IV) Complexes with 1-hydroxy-1-(p-ethoxyphenyl)-3-alkyl/aryl Thiourea

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Spectrophotometric investigations on Pt(IV) complexes with 1-hydroxy-1-(p-ethoxyphenyl)-3-alkyl/aryl thioureas have shown that 1 : 3 (metal : ligand) complexes predominate in the acidity range of 8.0-9.5 N-HCl. The stepwise and overall stability constant have been calculated. The analytical suitability of the reagent for microdetermination of platinum has also been investigated.

The analytical suitability of 1-hydroxy-1-(p-ethoxyphenyl)-3-alkyl/aryl thiourea has been investigated for the determination of various transition metals in this laboratory. The chelation has been attributed to the presence of $>N-CS-NHR$. The present communication deals with spectrophotometric studies of Pt(IV) complexes of 1-hydroxy-1-(p-ethoxyphenyl)-3-alkyl/aryl thiourea (HPAT) at different acidities. These investigations have established the existence of 1 : 3 (metal : ligand) complexes depending on the hydrogen ion concentration. The method may be applied satisfactorily for the micro determination of Pt(IV).

1-Hydroxy-1-(p-ethoxyphenyl)-3-alkyl/aryl thiourea was prepared by known method. The purity of the reagent was checked by elemental analysis, thin layer chromatography and IR spectra. Pt(IV) solution was prepared from H_2PtCl_4 and standardised volumetrically.

An aliquot of platinum solution was taken in a 100 ml separating funnel and its pH adjusted to the desired value. The reagent soln (0.08M) in acetonitrile was added and the mixture shaken thoroughly for 15 minutes. On standing for about 30 minutes, the coloured non-aqueous layer was collected in a small beaker. The extraction was repeated with 5 ml portions of acetonitrile. The combined extract was diluted to 30 ml with acetonitrile and its absorbance was measured at 480 nm.

Due to low reagent absorption around 480 nm, all the absorption measurements were taken against the reagent blank at 480 nm with 8.5 N-HCl. Measurements of absorbance of different sets of complementary solutions at 480 nm shows that 1 : 3 (metal : ligand) complexes predominate in the acidity range of 8.0-9.5 N-HCl. The system obeys Beer's law over the concentration range 1-9.5 ppm with 8.5 N-HCl (480 nm) is

($3.5 \times 10^3 \text{ l mole}^{-1} \text{ cm}^{-1}$). The Sandell's sensitivity is found to be 0.16 g Pt(IV) cm^{-1} for .001 absorbance.

Moderate amounts of ions commonly associated with platinum do not interfere with the estimation, like Hg(II), Co(II), Ti(IV), Fe(II), Cu(II) and Ni(II), however interfere in the determination. The stepwise and overall stability constants as obtained by methods of Harvey and Mannig³, Yatsimirskii⁴ and Leden⁵ are in close agreement with each other.

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