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**Spectrophotometric Determination of Palladium with a New Chelating
Reagent, 1-Methyl-3-(4-methyl-2-thiazolyl) thiourea***

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Out of 47 thiourea derivatives synthesized, the title compound was chosen to perform a screening test on the chelate formation with 66 metal ions. The formation of colored chelate was visually observed for Pd^{2+} , Cu^{2+} , Pt^{4+} , Au^{3+} , Ru^{3+} and Ag^+ in acidic media. The highest sensitivity was obtained for Pd chelate and the chelate formation was completed within five minutes at pH 2 at the room temperature. Conformity to Beer's Law is sufficiently good up to 4 ppm of Pd. The Pd chelate was readily extracted with chloroform and exhibited the maximum absorption at 280 and 320 nm. The excess reagent, causing an absorption peak at 290 nm, could be removed by shaking with 1 mol/l NaOH solution, while the chelate remained unchanged. The molar absorption coefficient was 1.76×10^4 (reference: H_2O) at 320 nm and 2.40×10^4 (reference: CHCl_3) at 280 nm. According to Ringbom's plot, the optimum concentration range was 0.8-4.4 ppm for the 320 nm peak and 0.6-3.2 ppm for 280 nm peak. Pretreatment of sample solution with perchloric acid was effective to reduce the interference of Cl^- , OsO_4 or Ru^{3+} and also to reduce the aging effect of the Pd solution of 10^{-3} - 10^{-4} mol/l.

The proposed procedure is as follows. Add several drops of perchloric acid to the sample solution containing up to 40 μg Pd and heat to almost dryness. Make up the solution nearly 10 ml and adjust the pH to about 2 with 1 mol/l NaOH solution. After adding 1 ml of the reagent solution (2×10^{-3} mol/l), extract the chelate by shaking with 8 ml of chloroform. Allow to stand for 5 minutes to fully separate the two layers. Then scrub the organic layer to remove the excess reagent with equal volume of 1 mol/l NaOH solution. Measure the absorbance at 280 nm in the chloroform as reference solution.

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