

I—9.

STUDY OF THE STABILITY OF PALLADIUM (II) ACETATE
COMPLEX BY POTENTIOMETRY AND POLAROGRAPHY

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Some properties of the palladium (II) acetate complex ion in solution have been studied. The stability constant of the complex has been approximately determined, and its possible application in polarographic analysis has been investigated. The conditions of complexing have been investigated at metal: ligand ratios of 1:10 to 1:2000. The most probable composition of the complex above a palladium: acetate ion ratio of 1:80 is $[\text{Pd}(\text{CH}_3\text{COO})_4]^{2-}$. Its anionic character has been confirmed by electrophoresis, the number of linked ligands by the Leden method, and the stability constant by potentiometric activity measurements of palladium (II) ions at a Pd electrode. The stability constant of this complex is approx. $1.2 \cdot 10^{12}$, at an ionic concentration of about 1 and pH 4.

In the same acetate buffer solution palladium (II) ions produce a polarographic wave with a half-wave potential of 0.22 vs. SCE. The electrode process is irreversible, and the current is of a diffuse character. The wave is not suitable for polarographic determination of palladium.

I—10.

DETERMINATION OF PALLADOUS IONS BY POTENTIOMETRIC
TITRATION USING Hg ELECTRODE

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The difference between the stability constant of palladous acetate and Pd-EDTA complexes (10^6) allows successful determination of palladous ions using Hg-electrode in an acetate buffer solution containing 10^{-3}M HgEDTA, titrating the palladous ions with EDTA. The optimum conditions of titration are when the ratio between palladous and acetate ions is 1:80. Chlorides, nitrites (from nitric acid formed during dissolution of Pd), large amounts of sulphates and ammonium ions interfere. Amounts from 10 to 50 mg Pd are determined and $99.5 \pm 0.3\%$ of the metal is found.

Using Hg electrode potentiometric titrations of thioglycollic acid in an acetate buffer solution with palladous nitrate or perchlorate were also performed. The potential jump at the equivalence point is very high. Quantities of 0.5 to 5 mg Pd are determined with $99.7 \pm 0.9\%$ recovery.