

oxide decreases with an increase in the quantity of alkali used for precipitation. This hydration ultimately affects the chemical properties of the oxide.

Further work on hydroxides is in progress, and the results, it is hoped, will throw considerable light on such phenomena.

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VANADOMETRY—PART II

Volumetric Estimation of Ferrocyanide Ion by Sodium Vanadate

FERROCYANIDE ion is oxidised in acid solutions readily to ferricyanide ion by a number of reagents, e.g., hydrogen peroxide, potassium permanganate, dichromate, chlorate, bromate, iodate, chlorine, bromine, iodine, ceric sulphate, etc. Many years ago De Haen¹ proposed the estimation of ferrocyanide by titration with potassium permanganate. Muller and Lauterbach² adopted the same reaction for electrometric titration. Kolthoff³ proposed an iodimetric method based on the reaction between ferrocyanide and iodine in neutral solution. Schwicker⁴ adds an excess of potassium iodate solution to the acid solution of the ferrocyanide and estimates the unreacted iodate by titration with a decinormal potassium bisulphite solution.

Recently Gopala Rao and Viswanadham⁵ and Gopala Rao and Ramanjaneyulu⁶ have found that sodium vanadate provides an excellent oxidimetric reagent which possesses some special advantages over potassium permanganate and potassium dichromate. We have now made experiments to see if sodium vanadate could be successfully employed for the volumetric estimation of potassium ferrocyanide. 5 mls. of 0.05 potassium ferrocyanide solution were taken into a beaker, diluted to about 150 ml. with distilled water and acidified with 10 ml. of about 15 N sulphuric acid. The solution

was titrated with 0.05 sodium vanadate solution, using 0.5 ml. of diphenyl benzidine solution as an internal indicator. At the end point, the colour changes from a pale green into a blue violet. We found that the colour change is sharply noticeable only when the overall acidity of the solution is above normal and the concentration of the ferrocyanide is not more than N/600. If the concentration exceeds this limit the solution must be suitably diluted. From the results tabulated below, it will be seen that the method gives accurate results under the conditions prescribed.

Amount of potassium ferrocyanide,
 $K_4Fe(CN)_6 \cdot 3H_2O$, in milligram mols.

By weight	By permanganometric titration	By vanadometric titration
0.2679	0.2682	0.2678
0.5358	0.5365	0.5356
0.8037	0.8047	0.8033
1.0716	1.0704	1.0712
1.3395	1.3417	1.3390
1.6074	1.6071	1.6092

We have also found that the estimation of ferrocyanide by vanadate can be accurately carried out even in the presence of hydrochloric acid, oxalic acid, etc., where permanganate fails. Details are communicated for publication elsewhere.

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A STUDY OF *CERCARIA FRASERI* BUCKLEY, 1939 IN MADRAS

IN the course of an investigation of the life-histories of some trematodes, a diplocotyle amphistome cercaria was found to issue from specimens of *Indoplanorbis exustus*, first on 15th September 1941 and