

sulphide is collected, washed with a mixture of alcohol and chloroform, converted into sulphate, and weighed. Manganese is estimated in another part of the chloroform solution after evaporation and burning off the organic matters.

L. DE K.

Volumetric Estimation of Iron and Tin by means of Stannous Chloride. By CONSTANTIN ZENGELIS (*Ber.*, 1901, 34, 2046—2050. Compare Campbell, *Zeit. angew. Chem.*, 1888, 168).—The method depends on the use of sodium molybdate as indicator, this, in the presence of the least excess of stannous chloride, yielding the characteristic molybdenum-blue. The blue colour is also given by cuprous chloride, but not by ferrous chloride. For the estimation of iron, the iron is converted into the ferric state and is then titrated with standard stannous chloride until the colour becomes very faint, the solution is boiled for a few minutes and a drop added to a drop of the indicator in a small porcelain dish; if no blue colour is developed, a few more drops of stannous chloride solution are added, the liquid again boiled, and the test repeated. An excess of hydrochloric acid does not appear to affect the end reaction.

For the estimation of tin, the metal is converted into stannous chloride, then oxidised with an excess of standard ferric chloride solution, and the excess of iron estimated as before with standard stannous chloride. Ordinary ammonium molybdate solution containing nitric acid may be used as indicator if freshly prepared, but after 1—2 weeks it no longer gives the blue colour with stannous chloride. The addition of a drop or two of a phosphate or arsenate, however, restores the property.

J. J. S.

Separation of Nickel and Cobalt. By ARTHUR ROSENHEIM and ERNST HULDSCHINSKY (*Ber.*, 1901, 34, 2050—2057).—The solution containing nickel and cobalt is mixed with an excess of ammonium thiocyanate (12 grams for 50 c.c. of liquid), and then shaken in a Rothe's apparatus with a mixture of amyl alcohol (1 vol.) and ether (25 vols.). The cobalt is removed by the ethereal liquid in the form of a complex thiocyanate (Treadwell, this vol., ii, 284) and the nickel remains in the aqueous liquid; this is evaporated to dryness, carefully ignited, dissolved in dilute nitric acid, and the nickel estimated electrolytically in the presence of ammonium oxalate.

The ethereal solution is shaken with a little dilute sodium hydroxide to remove any iron and then with 15—20 c.c. of 10 per cent. sulphuric acid. The acid cobalt solution is evaporated down, the excess of sulphuric acid driven off, and the cobalt determined electrolytically. The results obtained are remarkably good except when only minute quantities of cobalt are present with large quantities of nickel.

J. J. S.

Separation of Cobalt and Nickel by Electrolysis. By DIMITRI BALACHOWSKY (*Compt. rend.*, 1901, 132, 1492—1495).—On electrolysis at 70—80°, with a current of 0·8 ampere per ND_{100} and an *E.M.F.* of 1 volt, an acetic acid solution of cobalt and nickel containing 3 grams of ammonium thiocyanate, 1 gram of urea, and 1—2 c.c. of ammonium solution for each 0·3 gram of metal, the nickel is deposited