

Inorganic Chemistry.

Preparation of Hydroxylamine. By G. BERTONI (*Gazzetta*, 9, 569—570).—In order to avoid the inconveniences attending the precipitation of the tin by hydrogen sulphide and the evaporation of large quantities of solution containing free hydrochloric acid, as in the usual method of preparing hydroxylamine hydrochloride, the author employs lead oxide to precipitate the tin and hydrochloric acid; it has moreover the additional advantage of entirely removing the iron chloride which is always present and causes the decomposition of a large proportion of the hydroxylamine salt during the evaporation. The product of the reaction of the tin and hydrochloric acid on the nitrate is poured into a large basin, and hydrated lead oxide or carbonate added in successive portions until there is a slight excess with respect to the tin originally employed in the reduction: when the precipitation is completed, which happens in the course of a few days, the liquid is neutral or slightly alkaline, and after removal of the lead by sulphuric acid, should give no precipitate of tin sulphide with sulphuretted hydrogen. The liquid is then decanted, the residue heated several times with water to dissolve out the hydroxylamine salt, and the small quantity of lead which is present is precipitated by hydrogen sulphide. After filtration and evaporation to dryness, the hydroxylamine salt is extracted from the residue in the manner described by Lossen.

C. E. G.

Conversion of Hydroxylamine into Nitrous and Nitric Acids.

By G. BERTONI (*Gazzetta*, **9**, 571—574).—When a dilute solution of hydroxylamine is rendered alkaline with baryta and treated with potassium permanganate, it is immediately reduced, and on examining the solution it will be found to contain nitrous acid. If the hydroxylamine solution is rendered acid with sulphuric acid, its reducing action on the permanganate is very much slower, and in this case nitric acid is formed. In neither reaction, however, is the whole of the hydroxylamine converted into the acid. Chromic acid behaves in a somewhat similar manner, producing nitric and nitrous acids, whilst the oxides of the noble metals yield nitrous acid only. The author hopes to found a quantitative process for the estimation of hydroxylamine on this reaction. Red blood-corpuscles are deoxidised by hydroxylamine, but the products formed have not been examined. The powerful reducing action of hydroxylamine causes it to act as an energetic poison when injected subcutaneously, and also when exhibited internally.

C. E. G.

Reduction of Carbonic Anhydride by Phosphorus at Ordinary Temperatures. By A. R. LEEDS (*Ber.*, **12**, 2131).—The author finds that, although large quantities of phosphine are produced under the conditions stated in a previous paper (this vol. 237), no reduction of carbonic anhydride to carbonic oxide takes place.

G. T. A.

A New Hydride of Silicon. By J. OGIER (*Compt. rend.*, **89**, 1068—1070).—Silicon tetrahydride is decomposed by the electric discharge, hydrogen being liberated, and a yellow deposit formed which has the composition SiH_3 . The new compound ignites on percussion, and burns when heated in the air: it also takes fire in an atmosphere of chlorine.

When exposed to a temperature of 400° , the tetrahydride splits up into hydrogen and silicon.

Phosphoretted and arseniuretted hydrogen are also decomposed by the electric discharge, with formation of solid hydrides.

W. C. W.

Luminosity of Phosphorus. By W. MÜLLER-ERZBACH (*Ber.*, **12**, 2130).—The statement of Joubert (*Compt. rend.*, **79**, 693) that the luminosity of phosphorus is due to oxidation of its vapour is not new. The author has stated the same fact in *Pogg. Ann.*, **141**, 95, and *Ber.*, **3**, 84.

G. T. A.

Pentathionic Acid. By F. KESSLER (*Annalen*, **200**, 256—259).—In replying to Spring's paper on the non-existence of pentathionic acid (*Ann.*, **199**, 79) the author points out that his analyses (*Pogg. Ann.*, **74**, 274) proved that the acid which is produced by the action of sulphuretted hydrogen on sulphurous acid was *penta-* and not *tetra-*thionic acid.

W. C. W.

Reduction of Metallic Oxides by Hydrogen. By W. MÜLLER-ERZBACH (*Ber.*, **12**, 2130).—The statement made by Wright and Luff in their papers on "Researches on some Points in Chemical Dyna-

mics (this Journal, 1878, 1 and 504), that the initial temperature for the reduction of oxides depends on their physical nature, has been already published by the author (*Pogg. Ann.*, **136**, 51). Also their statement that precipitated copper oxide is not reduced by hydrogen at a temperature below 83° has been forestalled by the author, who gave it as 82° (*Pogg. Ann.*, **153**, 332). G. T. A.

Copper Hydride. By BERTHELOT (*Compt. rend.*, **89**, 1005—1011).—The anomalous results observed in the amount of heat absorbed in the formation of copper hydride (which was found to vary from -2.7 to -8.7 in different specimens) induced the author to analyse the substance. A sample prepared by the addition of sodium hypophosphite to a solution of copper sulphate and dilute sulphuric acid, purified by washing with water containing carbonic acid, and dried on porous plates over sulphuric acid in an atmosphere of carbonic anhydride, had the following composition:

Cu 87.2 H; 0.08; H_2O 1.3; S 0.28; P 1.34; O combined with Cu 4.6. O combined with S and P, loss, &c., 5.2 per cent.

It may be regarded as a complex compound of hydroxide and phosphate of copper.

When boiled in water, the so-called hydride gives off hydrogen, and leaves a residue which contains besides copper, small quantities of oxygen, sulphur, and phosphorus. W. C. W.

Copper Hydride. By A. WURTZ (*Compt. rend.*, **89**, 1066—1068).—In reply to Berthelot's criticisms, the author points out that pure cuprous hydride can be obtained by the electrolytic decomposition of a dilute solution of copper sulphate, or by the action of sodium hypsulphite, Na_2SO_2 , on copper sulphate. When the hydride is treated with hydrochloric acid, the volume of hydrogen liberated is twice that set free when the hydride is decomposed by heat. W. C. W.

Copper Hydride. A Reply to Wurtz. By BERTHELOT (*Compt. rend.*, **89**, 1097—1099).—The author maintains that the existence of cuprous hydride is purely hypothetical, since the so-called compound invariably contains constitutional water. W. C. W.

Copper Hydride. By A. WURTZ (*Compt. rend.*, **90**, 22—24).—In the preparation of cuprous hydride at the ordinary temperature, the portion which is first deposited contains only very slight traces of phosphate. The mean of two analyses gave—

	Found.	Calculated.
Cu_2	98.52	98.45
H_2	1.48	1.55

W. C. W.

Atomic Weight of Antimony. By F. KESSLER (*J. pr. Chem.* [2], **20**, 114—123).—(Comp. this Jour., **36**, 772.) A critical discussion of the methods and results of the five more important investigations of this constant, leads the author to the following conclusions:—The determinations of Schneider, by the ignition of a native sulphide

(Arnsberg glance), in hydrogen gas, are untrustworthy, he having overlooked the presence of calcespar as an impurity in the ore: so also are Cooke's numbers; both those obtained from the synthesis of Sb_2S_3 , in the wet way, and subsequently heating to 2 O° in a stream of hydrogen, through the oxidation of a portion of the sulphide in the latter process, due to the presence of nitrogenous impurity (N_2O) in the hydrogen used; and also those obtained from the analyses of halogen compounds on account of the contamination of the silver precipitates with the sparingly soluble salt, $\text{AgSbO.C}_4\text{H}_4\text{O}_6$, and probable impurities in the $\text{SbCl}_3(\text{H}_2\text{O})$, SbBr_3 , and $\text{SbI}_3(\text{SBr}_2.\text{SI}_2)$, the two latter compounds having been prepared in presence of carbon bisulphide. On the other hand, after applying a correction to the number obtained by Dumas for the $\text{AgSbO.C}_4\text{H}_4\text{O}_6$, here also most probably contained in the silver precipitate, we obtain $\text{Sb} = 122.29$. The number assigned by Dexter, 122.33, the author regards as trustworthy, whilst the mean value obtained by the author himself from three series of experiments was 122.29. The final conclusion to be drawn is that 122.3 represents the atomic weight of the metal; or, on the assumption of Stas ($\text{H} = 1$, $\text{O} = 15.96$) the integral 122.

C. F. C.

Atomic Weight of Antimony. By J. P. COOKE (*Ber.*, 12, 2123—2124).—A reply to the objections of Kessler to the author's results. (See preceding abstract, and this Journal, 36, 354 and 772.)

Galvanic Experiments (Platinum Bases). By E. DRECHSEL (*J. pr. Chem.* [2], 20, 378—380).—The method employed is to continuously and rapidly reverse the galvanic current from platinum poles through the solution operated upon. By acting in this manner on commercial ammonium carbonate (containing ammonium carbamate) for a period of eight hours, and then evaporating on the water-bath, a salt crystallising in fine white needles was obtained. It was found to contain 64.69 per cent. platinum, and is the salt of a platinum base; its composition could not be satisfactorily settled on account of want of material. Concentrated hydrochloric acid gives a bright green, nitric acid a sky-blue crystalline precipitate with its solution. About 0.1 gram platinum was dissolved in ten hours by the ammonium carbonate.

On working the commutator more slowly, the temperature of the liquid rises and no precipitate is formed, but by simultaneous cooling a crystalline precipitate occurs, which contains 38.6 per cent. platinum, and is also the salt of a platinum base; this yields no bright green precipitate, but an almost colourless one with hydrochloric acid, consisting of microscopic needles. By operating on a solution of glucose mixed with sodium phosphate, with very large platinum electrodes, prevented from touching each other by a sheet of filter-paper, the places on the platinum where the paper had rested were found at the end of the experiment to be covered with a brownish translucent substance, easily removable in large plates; this on ignition left a large amount of platinum, but its properties have not as yet been investigated.

H. Kolbe remarks in a note to the paper that these interesting

results have induced him to extend his earlier galvanic experiments, and to study the action of rapid change of poles on a number of salts.

F. L. T.
