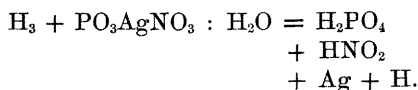


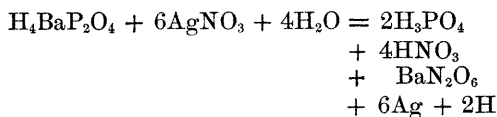
## II.—On the Reducing Power of Phosphorous and Hypophosphorous Acid and their Salts.

By C. RAMMELSBURG.

*Phosphorous Acid and Silver-Salts.*—By employing an excess of nitrate of silver, I found that 1 mol. of  $\text{H}_3\text{PO}_3$  reduces 1 at. of Ag, while H becomes free.

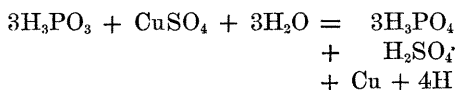


*Hypophosphite of Barium and Silver-Salts.*—1 mol.  $\text{H}_4\text{BaP}_2\text{O}_4$ , with an excess of nitrate, gave 5 Ag, and with sulphate of silver, 5.5 Ag. Admitting 6 Ag we should have



The reducing power of the molecules  $\text{H}_3\text{PO}_3$  and  $\text{H}_3\text{PO}_2$  seems to be = 1 : 3.

*Phosphorous Acid and Copper Salts.*—An excess of  $\text{H}_3\text{PO}_3$  decolorises the solution, protoxide of copper being formed. When the sulphate of copper is prevalent, metallic copper is separated, after boiling for some time, and I found that for 3 at. of P 1 at. of Cu is reduced



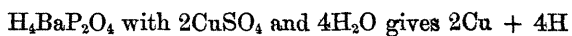
*Phosphite of barium* is not changed by boiling with a solution of copper; when free sulphuric acid is added, a very small quantity of the metal is precipitated.

*Hypophosphorous Acid and Copper Salts.*—Wurtz has published his experiments on this subject, and the very interesting formation of  $\text{HCu}$ . H. Rose asserted (*Pogg. Ann.*, 58, 304), that the reduction of copper was not accompanied by evolution of free hydrogen.

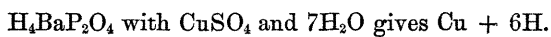
Hypophosphite of barium and an excess of sulphate of copper yield the reduction only at the boiling point of the liquid. I found Ba : Cu = 1 : 2 atoms. Hence it is evident that hydrogen is evolved.

But if free sulphuric acid is added, the reduction begins below  $100^\circ$ , and the quantity of the metal is only *half* what it was in the preceding case.

The two processes must be :



and



The hydrogen is evolved with great rapidity.

Hypophosphite of sodium with an excess of copper-salt gives  $\text{Na} : \text{Cu} = 1 : 1$  at., but the reaction requires continued boiling.

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