LEAD CYANIDE.

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According to Rammelsberg (D.R.-P. 139456), the compound $Pb(CN)_2$ is formed by precipitating a solution of a lead salt with aqueous hydrocyanic acid or a soluble cyanide, whereas Kugler (*Annalen*, 1848, **66**, 63) states that a basic salt, $Pb(CN)_2$, $2PbO,H_2O$, is formed by precipitation from an ammoniacal solution. It appears, however, to be generally recognised that the precipitate formed by the interaction of cyanides and lead salts in aqueous solution varies in composition with the concentration of the solutions employed, a fact which the author has confirmed.

Lead cyanide was decomposed by hydrogen sulphide, and the hydrogen cyanide was led into water through a U-tube containing lead cyanide, To remove any traces of hydrogen sulphide from the aqueous hydrocyanic acid, some lead cyanide was added to it, and the solution shaken- As no trace of hydrogen sulphide was present no lead sulphide was formed; but after filtering this solution it was found that it contained a considerable quantity of lead. It was evident that lead cyanide, which is not appreciably soluble in cold water, is soluble in aqueous hydrocyanic acid, and it was expected that this solution would, on evaporation, deposit pure lead cyanide free from oxide.

About 250 c.c. of a 5 per cent. solution of hydrocyanic acid were heated to boiling with a small quantity of precipitated lead cyanide under reflux. After about half an hour the solution was filtered and allowed to evaporate slowly in a desiccator. The deep yellow, needle-shaped crystals which separated were collected and dried in a vacuum.

Lead cyanide, even when powdered, appears to be unattacked by concentrated nitric and sulphuric acids in the cold. On adding water to a crystal, the insoluble oxycyanide is formed, and the water becomes cloudy.

A weighed quantity of the substance was heated for some hours to 120°; there was no loss in weight.

For the estimation of cyanogen and lead a weighed quantity of the substance was heated in a water-bath in a sealed tube with a weighed excess of silver nitrate and a little nitric acid. The silver cyanide was collected and weighed. The silver remaining in solution was precipitated and weighed as silver chloride, which served as a check on the weight of the silver cyanide. Finally the filtrate was evaporated with sulphuric acid, and the lead sulphate weighed Two different samples were analysed:

I. 01838 gave 0·1888 AgCN and 0·2137 PbSO CN=19·90;

II. 0·2272 gave 0·2340 AgCN and 0·2638 $PbSO_4$. CN=20·00; Pb=79·32.

$Pb(CN)_2$ requires CN=20·07; Pb=79·92 per cent.

The crystals consisted therefore of lead cyanide having the formula $Pb(CN)_2$.

R. P. B.—4-1914.—500.