of its metallic salts, the copper salt for instance, yield precipitates upon boiling of compounds of the lower oxides of the metals. The barium salt, BaN_2 , crystallizes from solution in large brilliant anhydrous crystals. With silver nitrate, the aqueous solution of the acid or a soluble salt yields a precipitate closely resembling silver chloride in appearance. Silver nitride,

does not, however, darken when exposed to light, and is further distinguished from silver chloride by its fearfully explosive properties. During the course of his description at Bremen, Prof. Curtius placed a quantity of this salt less than 0.001 gramme in weight upon an iron plate, and then touched it with a heated glass rod. A sharp and loud detonation resulted, and the plate was considerably distorted. The mercurous salt, Hg_2N_2 , is likewise very explosive. The metallic salts are readily converted into ethereal salts by reacting upon them with the haloid ethers. The phenyl salt thus prepared,

is in every way identical with the diazobenzene imide, so long ago prepared by Griess. A. E. TUTTON.

A LECTURE EXPERIMENT.

By SAVILLE SHAW, F.C.S.

THE following slight modification of a well known lecture experiment may possibly prove of service to some of your readers.

The ordinary forms of apparatus for illustrating the indestructibility of matter by the increase in weight of a burning candle have the disadvantage either of re-

quiring the use of an aspirator, which is apt to draw the student's attention from the more essential part of the experiment, or in the modification, where the chimney itself contains the absorbing material, the draught is often uncertain, and a deposit of soot liable to occur and choke up the spaces between the lumps of soda lime and caustic soda used.

Both these inconveniences are obviated by employing the apparatus shown in the figure, which consists of a small petroleum lamp, *a*, suspended in a wire framework beneath an ordinary lamp chimney, *b*, sufficient space being left to allow of the lamp being lighted without removal. The chimney contains a coil of coarse copper gauze, *c*. In the lower part of the narrow portion above this is placed a rather open roll of iron gauze, *d*, provided with a handle of bent wire to facilitate its withdrawal, the roll being coated with caustic soda. The covering of the gauze is easily performed either by dipping it in molten caustic contained in a nickel basin, or by ladling the melted substance over it.

The chimney may be removed from the apparatus and both ends closed by corks, enabling it to be used repeatedly without renewal. The gain in weight in three or four minutes amounts to about one grain, sufficient to show very appreciably on even a coarse lecture balance.

The Durham College of Science, Newcastle-on-Tyne.
—Chem. News.

ON THE ACTION OF LIGHT ON CHLORINE WATER.

It is frequently assumed that when an aqueous solution of chlorine is exposed to light, the whole of the chlorine unites with the hydrogen of the water, setting free an equivalent quantity of oxygen. Pedler has investigated this reaction, using the sunlight of Calcutta to effect it. He finds that chlorine and water have comparatively little action on each other, even in tropical sunlight, when the number of water molecules is not more than one hundred times the number of chlorine molecules. When the number of water molecules is 150 times that of the chlorine molecules, the action may reach 50 per cent. of that actually possible. And even when it reaches 400 times, the reaction, while more rapid, reaches only four fifths of the possible amount. In ordinary chlorine water, saturated at 30°,

there is about 0.5566 gramme of chlorine in 100 c. c. of water; or about 708 molecules of water to each molecule of chlorine. So that with such a solution, the decomposition may be expected to be both more rapid and more complete. Experiments with this solution show that in full sunlight the main reaction which takes place is that represented by the equation $(\text{H}_2\text{O})_2 + (\text{Cl}_2)_2 = (\text{HCl})_4 + \text{O}_2$; while in feeble diffused light, the reaction at first is probably $\text{H}_2\text{O} + \text{Cl}_2 = \text{HCl} + \text{HClO}$; this hypochlorous acid being in its turn decomposed by light and yielding chloric acid. So that the final reaction is $(\text{Cl}_2)_2 + (\text{H}_2\text{O})_4 = (\text{HCl})_4 + \text{HClO}_2 + \text{O}$. Hence the action of chlorine on water is, in its first stages at least, quite similar to that of chlorine on cold dilute solutions of potassium or sodium hydrate. In its second stage, the action of chlorine on water is similar to its action on hot concentrated solutions of these hydrates.—J. Chem. Soc.

FLUORINE AND CARBON.

MOISSAN has observed that fluorine and carbon combine with great energy even at ordinary temperatures. Lampblack, purified and dry, becomes incandescent at once in fluorine, and wood charcoal takes fire in it spontaneously. Denser forms become incandescent in fluorine only on heating to 50° or 100°. Graphite from cast iron unites with fluorine below redness, and Ceylon graphite and gas carbon at a red heat. If the carbon be in excess, and the temperature be not allowed to rise too high, the product is carbon tetrafluoride CF_4 , a colorless gas liquefying at 10° under a pressure of five atmospheres. In contact with an alcoholic solution of potassium hydrate, it yields potassium fluoride and carbonate. It is not decomposed by the electric spark and is soluble in carbon tetrachloride, alcohol and benzene. At a red heat, the action of fluorine on carbon yields a gaseous carbon fluoride which is not absorbed by alcoholic potash and is almost insoluble in water, although it is dissolved by alcohol.—J. Chem. Soc.

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