

When this periodide is exposed to the air it gradually acquires a blue colour, but if allowed contact with sodic-bicarbonate in quantity this colour is produced instantaneously and voluminously with a beautiful and striking effect. In shade it is not to be distinguished from that of the compound of iodine with starch.

The new salt thus produced is almost, if not entirely, insoluble in water, hot or cold, also in potassic-iodide or alcohol, nor is its appearance changed by these liquids.

Treated with any ordinary acid, even with the acetic, it is instantly decomposed, carbonic acid and iodine being liberated. Any free alkali also decomposes it; carbonic acid, even, in conjunction with water, decomposes it, but very slowly, iodine being liberated in a free state. By spontaneous evaporation, it can be had in acicular crystals.

It appears to be composed of iodine and carbonic acid with lead and oxygen.

The effect of a long-continued contact of this salt with carbonic acid and water is to produce another compound of quite a different kind. This is insoluble in acetic acid and quite colourless.

There are two points in connection with this subject which I would particularly desire to bring to your notice; they are—first, that this reaction of per-iodide of lead with carbonic acid is a very delicate and beautiful test for this acid; thus when shaken up in a finely granular form (as precipitated) with ordinary spring or rain water, mixed with a little borax if need be, or if breathed upon, the presence of this acid is revealed by a greenish colour being instantly communicated to the water, which colour soon passes to a blue if the acid is present in more than a very minute quantity. This is a striking demonstration for the lecture-room, and the only chromatic test as yet known for the presence of the acid cited.

The next point I wish to note is the striking resemblance of the colour of this new compound to that of iodine with starch. This is strongly suggestive of the idea that in both compounds the iodine is in the same molecular state, and consequently that the compounds themselves possibly are in some fundamental points analagous.

ART. LIV.—*The Dimorphisim of Magnesia.*

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WHILE trying to electro-deposit gold from sea-water, so as to verify Sonstrad's observation regarding gold in sea-water, and if possible to estimate it, I ap-

plied iodine to the supposed auriferous deposit, when a highly coloured substance formed. This I at first took for palladium-iodide, but soon found it to be magnesium oxy-iodide, or at least a substance made up of the three substances—magnesia, oxygen, and iodine.

Afterwards I found that magnesia, prepared at a certain temperature, behaved just like this electro-deposited magnesia, that is in absorbing iodine. At a high temperature, about 1,000° F. both these forms of magnesia lose this absorbent property.

Certain aniline dyes and cochineal, also, are absorbed by this modified magnesia.

From these facts I make the deduction that magnesia can exist in two forms, and this receives confirmation by the fact that it is made denser by ignition.

Further I find that magnesia may be exhausted out of ammoniacal solutions by an electric battery of two cells, and this really forms a capital way for separating and estimating it in analysis. The alkalies are then in due course left pure for easy estimation. The phosphoric acid, which is now used to effect this, and which complicates the process so much, being thus rendered unnecessary.

But not only is quantitative analysis thus aided in this case, but the detection of magnesia by means of the battery and iodine becomes a very simple matter, and especially to be recommended for use when but small quantities of test substances are to be had. I find that by these means the $\frac{1}{10000}$ of a grain of magnesia can be recognized in but $\frac{1}{2}$ a grain of liquid. It is therefore far more delicate than the old tests.

I should state that lime, baryta, alumina, do not when electro-deposited, give a chromatic reaction with iodine.

The compound iodide described, is easily decomposed by acetic acid, or an alkali. And very slowly decomposed by water. The iodine being in each case detectable in the solution by means of the starch test.
