



Mode in which some salts act in hydrogen gas

Wöhler

To cite this article: Wöhler (1839) Mode in which some salts act in hydrogen gas, Philosophical Magazine Series 3, 15:95, 248-249, DOI: [10.1080/14786443908649863](https://doi.org/10.1080/14786443908649863)

To link to this article: <http://dx.doi.org/10.1080/14786443908649863>



Published online: 01 Jun 2009.



Submit your article to this journal [↗](#)



Article views: 2



View related articles [↗](#)

potassium, which are readily separated by treating the mixture with water, which dissolves the chloride of potassium and of calcium, while the magnesia is left; from the mixture of chloride of potassium and of calcium, the lime is precipitated by carbonate of soda.—*Journal de Pharm.* July 1839.

MODE IN WHICH SOME SALTS ACT IN HYDROGEN GAS. BY
WÖHLER.

Some researches on the peculiar mode of composition of mellitic acid, have caused me to observe that the salt of silver of this acid, exposed to pure hydrogen gas at 202° , very quickly changed from its white colour to black, and was afterwards soluble in water and imparted a deep red colour to it. During this reaction a little water was formed, and it lost oxygen, equal to half the weight of that contained in the oxide. The brown solution of the altered salt was strongly acid, and deposited after some time bright metallic silver, and became colourless; it then contained merely the common colourless salt dissolved in free acid.

This circumstance indicated with great probability, that by the action of the hydrogen upon this salt, the silver was reduced to the state of protoxide, a supposition which was completely confirmed by examining into the modes in which other salts of silver exist, and the existence of a protoxide of silver was satisfactorily determined.

Of some other salts of silver which I carefully examined with this view, the nitrate was that which evinced the most evident alteration. When exposed at 212° to a current of dried hydrogen gas, it becomes throughout the mass, and very quickly, of a deep brown colour. The action even begins at common temperatures, as it does with the mellitate. The mass is then a mixture of nitrate of protoxide and free nitric acid. Half of the oxygen of the oxide of silver is disengaged in the state of water, from two atoms of the salt of the deutoxide; there is formed Ag^2O , which remains combined with half of the acid, whilst the other half is set free. Water dissolves the free acid, and as soon as the principal part of this is removed, the protosalt begins to dissolve in the pure water with a deep red colour. In the dry state this salt is a powder of a deep brownish black colour. When heated it decomposes with a much weaker detonation than the white deutosalt. It then leaves 76 per cent. of metallic silver, a quantity which ought to remain according to the formula $\text{Ag C}^4 \text{H}^4 \text{O}^4$.

If the red solution of the protosalt be boiled, it gradually decomposes with a slight disengagement of gas; it becomes opalescent and of a peculiar yellowish green colour; afterwards it deposits metallic silver, and becomes colourless. The brown protosalt dissolves in ammonia also with a very deep yellowish red colour. When heated the solution undergoes a decomposition similar to the preceding. Sometimes the sides of the vessel are covered with a brilliant metallic coating almost of a golden colour, and which, like very finely divided gold, is transparent and of a fine green colour.

Potash precipitates a perfectly black heavy powder from the red solution of the protosalt, which is rendered colourless at the same time. This black powder is obtained also by the direct decomposition of the dry salt by means of a solution of potash; this precipitate remains black after drying; by pressure it becomes of a deep metallic lustre, and by heat is reduced to metallic silver, evolving oxygen. The black colour seems to indicate that it is pure protoxide of silver; but this supposition does not always depend on the colour, for this powder might also be, consistently with its properties, an intimate mixture of deutoxide of silver and metallic silver, to which the protoxide may have given rise at the moment of its separation. It is also decomposed by the acids into metal and deutosalts, and ammonia exerts a similar action. Hydrochloric acid converts it into a brown substance, which is a chloride corresponding with the protoxide or perhaps merely a mixture of silver and common chloride of silver; this substance is also obtained in the state of a brown, curdy precipitate, which speedily subsides, by precipitating the red solution of protonitrate of silver by hydrochloric acid; it acquires the metallic lustre by pressure. When heated to the temperature at which chloride of silver fuses, it becomes merely a yellow mass, and is a mixture of silver with the common chloride. When treated with ammonia, or even with concentrated solution of the hydrochlorate, the brown chloride is decomposed immediately into chloride which is dissolved, and into metallic silver which remains.

Oxalate of silver when exposed at 212° to the action of hydrogen gas, becomes of a bright yellow tint; but the decomposition seems to remain only partial at this temperature. It became brown at 284° ; but it soon afterwards produced a very loud explosion. Succinate of silver becomes lemon-yellow at 212° in hydrogen gas. At a higher temperature, half of the succinic acid sublimed. The protosuccinate of silver thus formed is insoluble in water. Pure deutoxide of silver is reduced to the metallic state precisely at 212° in hydrogen gas.—*Journal de Pharm. Juillet 1839.*

ON CUBEBIN. BY MM. CAPETAINE AND SOUBEIRAN.

We have discovered on cubebs a peculiar matter, to which we give the name of *Cubebin*. Although M. Monheim has already applied this word to a product which he obtained in his experiments on cubebs, it is certain that he did not procure the true cubebin, as may be seen by the properties which he assigns to it. The cubebin of M. Monheim is greenish, has an acrid taste, melts at 68° , boils at 86° , and then is partly volatilized, whereas the true cubebin is white, insipid, inodorous, and decomposes before it fuses.

The process which we found to succeed best in obtaining cubebin, consists in pressing the marc which remains after the preparation of the volatile oil of cubebs to make an alcoholic extract of it, and to treat this extract with a solution of potash, as proposed by Poulet for the preparation of pipesin. The cubebin is to be washed with a little water, and to be purified by crystallization repeatedly from alcohol.