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On the galvanic oxidation of gold

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under all circumstances, even at temperatures below zero at which the psychrometer will not serve. A determination takes fifteen minutes. After finishing one, the apparatus can, without any further preparation, be used for a second; and once filling with sulphuric acid suffices for many thousand determinations. Volume-percentages are read off directly from the apparatus. For calculating percentages of volume into millimetres vapour-pressure the formula $e = V \frac{b}{100}$ is employed, in which V denotes the volumes, e and b the heights of the barometer. The same apparatus can also be used for fog-measurement. For that purpose we warm the foggy air a little, before it enters the volume-hygrometer, and then proceed as usual: we thus obtain the total amount of the aqueous vapour, consisting of that which was present as such in the air and possessed the maximum of tension, plus that which was first formed by the volatilization of the fog vesicles.—E. W. in the *Beiblätter zu den Annalen der Physik und Chemie*, 1879, No. 7, p. 485.

ON THE GALVANIC OXIDATION OF GOLD. BY M. BERTHELOT.

Grotthuss, in his classic experiments on the decomposition of water by the galvanic pile*, remarked the solution of a gold wire employed as the positive pole in sulphuric acid traversed by the current. This interesting fact was pointed out to me by our venerated dean, M. Chevreul, who asked me if such an effect might not be due to the formation of persulphuric acid. It was for the purpose of replying to his question that I made the following experiments.

I first repeated Grotthuss's experiment, which is precisely as he described it. The sulphuric acid (at 10 per cent.) becomes yellow and rapidly dissolves the gold wire: the dissolved gold can easily be detected by means of stannous chloride. A portion is reprecipitated upon the negative pole.

Nitric acid, under the same conditions, equally attacks gold, and becomes filled with a violaceous precipitate (gold or aurous oxide?), which remains in suspension.

Dilute phosphoric acid, on the contrary, does not appreciably attack gold, even under the influence of the galvanic current; nor has potass any greater action.

That gold is attacked by sulphuric and nitric acids is not due to ozone; for oxygen charged with ozone remains without action upon gold in the presence of water, whether pure or charged with sulphuric or nitric acid.

Nor does persulphuric acid (prepared by electrolysis) attack gold, even if it contains in addition a portion of oxygenated water.

It follows from these observations that the attacking of gold takes place solely under the influence of the galvanic current and at the contact of the electrode with the electrolyzed liquid.—*Comptes Rendus de l'Académie des Sciences*, Oct. 27, 1879, p. 683.

* *Annales de Chimie*, t. lxxviii. p. 60.