



On the resistance to disruptive discharge offered by gases under high pressures

Max Wolf

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short duration, nor is so similar to heat that it cannot change into dielectric displacement—increases on heating from approximately zero to a maximum. It decreases after this, and with the occurrence of perfect conduction it entirely disappears.—*Sitzungsberichte der Wiener Akademie*, June 21, 1889.

ON THE RESISTANCE TO DISRUPTIVE DISCHARGE OFFERED BY
GASES UNDER HIGH PRESSURES. BY MAX WOLF.

At the instance of Prof. Quincke the author attempted to ascertain what resistance certain gases offered at high pressure to the passage of the electrical spark. In other words, the difference of potential of two spherical surfaces was determined at the moment of the discharge, for different gases and at various pressures greater than one atmosphere. In this a method was used similar to that used by Quincke for determining striking distances in insulating liquids. It was to be expected that under higher densities the irregularities in the discharge occurring under smaller pressures must be less prominent.

The conclusions arrived at are as follows :—

(1) The electrical force which produces the disruptive discharge in various gases between spherical surfaces of 5 centim. radius and at a distance of 0.1 centim. increases proportionally to the pressure for pressures between 1 and 9 atmospheres.

(2) The increase of the electrical force for simpler gases (oxygen, hydrogen, and air) is inversely proportional to the mean path of the gas-molecules.

(3) With carbonic acid the product from the increase in the electrical force into the mean path for an increase of pressure for one atmosphere is considerably smaller (almost one half) that of simple gases.

(4) One or more discharges are necessary until the resistance of a gas is attained, and the resistance is at first so much the less than in the later discharges, the higher is the pressure on the gas.—Wiedemann's *Annalen*, vol. xxxvii. p. 306 (1889).

THE NATURE OF SOLUTIONS. BY S. U. PICKERING.

On pages 36–38 of this Magazine Prof. Arrhenius publishes a criticism of my paper on this subject. I venture to think that it is somewhat rash of Prof. Arrhenius to attack a paper which has not yet been published, and of which only a short abstract, destitute of all experimental data, has as yet appeared in print. If he will wait till the paper be published in full (and it may be some months yet before it is so) he will, I think, find that several of his criticisms are mistaken, and that the others have already been answered. If otherwise, I shall then be ready to answer him on any point which he may raise.

July 2, 1889.