

Letters to the Editor

PROMPT publication of brief reports of important discoveries in physics may be secured by addressing them to this department. The closing date for this department is the third of the month. Because of the late closing date for the section no proof can be shown to authors. The Board of Editors does not hold itself responsible for the opinions expressed by the correspondents. Communications should not in general exceed 600 words in length.

Gases Evolved by Magnetized Iron in Sulfuric Acid

R. L. HOFF, J. J. NAUGHTON, R. SMOLUCHOWSKI,
AND H. H. UHLIG

Research Laboratory, General Electric Company, Schenectady, New York
May 29, 1944

SEVERAL months ago we were asked to report whether oxygen was one of the products resulting from the reaction of magnetized iron with dilute sulfuric acid. The first experiment was set up as shown in Fig. 1. A piece of Swedish iron 4.7 cm $\times$ 1.2 cm diameter was placed in 5 percent sulfuric acid within the field of a solenoid whose strength at the center measured 286 oersteds. The acid was prepared from distilled water boiled vigorously for more than one hour and cooled in nitrogen to remove appreciable dissolved oxygen. Gas evolved by the iron specimen was collected in a glass-stoppered tube and sealed to a microgas-analysis equipment designed for the analysis of gases in metals. Oxygen was determined by change in pressure of the dried gas, after reacting with

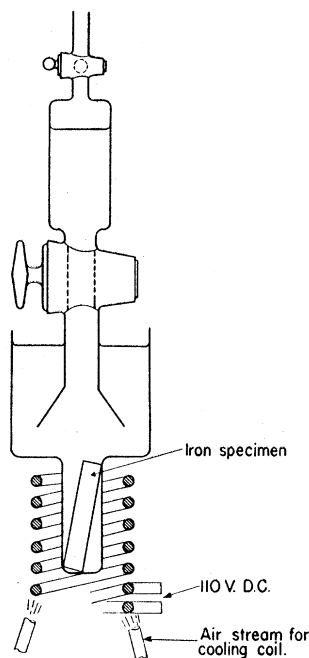
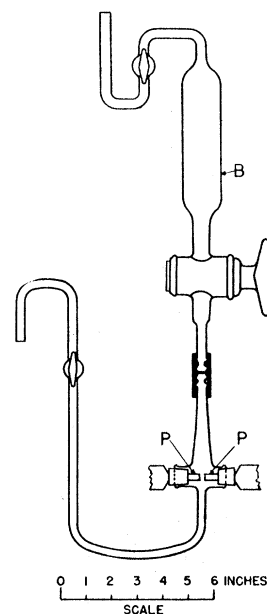


FIG. 1. Experimental arrangement to collect gases from magnetized iron in dilute sulfuric acid.

FIG. 2. Arrangement for the collection of gases from pole pieces *P*.



hydrogen over hot platinum and condensing out water in a solid CO_2 trap. The complete analysis was as follows.

Oxygen	0.0 ± 0.2 vol. percent
Hydrogen	94.7 vol. percent
Hydrocarbon as methane	4.5 vol. percent
Residue as nitrogen	0.5 vol. percent

The method was sensitive to better than 0.2 vol. percent oxygen, but within this limit, none was found.

Another experiment was performed in the apparatus shown in Fig. 2. The field strength used was now much higher, namely, 13,000 oersteds (measured in air) between two 0.64-cm ($\frac{1}{4}$ in.) diameter pole pieces *P* of Swedish iron separated by a 0.16-cm ($\frac{1}{16}$ in.) gap. Water likewise was boiled and cooled in nitrogen, and at no time was it in contact with air. Gases were collected in tube *B* in which there was always some water above the stopcocks in order to prevent gas leakage. Analyses were performed by two methods: One was the same as that described above and gave the same negative result; the second method using 150-ml samples was that of oxygen absorption in pyrogallol. The result of the latter analysis was 0.02 to 0.05 vol. percent oxygen. The difference between gas collected with and without magnetic field was within the limit of error and random in sign.

On the Quantization of Probability

HENRY F. DUNLAP

University of New Mexico, Albuquerque, New Mexico
March 2, 1944

THE recently proposed quantization of probability¹ leads to an apparent contradiction when applied to a particular problem.

Consider an enclosure of volume *V*, containing a grain of sand of volume *G*. The enclosure is assumed field free