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**THE IMPORTANCE OF GAS MEASUREMENTS IN 'COLD FUSION' EXPERIMENTS\*\***

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Since heat production is the critical signature of a "Pons-Fleischmann type cold fusion" experiment, it is necessary to make excess heat measurements based on the integral of total-energy-output/total-energy-input over the entire lifetime of cell operation. In this connection, rigorous exclusion of all alternate chemical energy-release steps is required, hence production of various peroxides could be an important aspect of the experiment. Oxidation of water, or dissolved carbonate ion, at the anode would lead to an accumulation of peroxide in solution which could react subsequently with H atoms at the surface of a metallic cathode with great vigor. In order to distinguish this possibility, it is important to measure peroxide concentration in the solution. A preliminary indication of such a phenomenon is given by the relative ratio of  $O_2/H_2$  release at the electrodes. As a result of Faraday's law, the  $O_2/H_2$  ratio must be 1:2 if no side reactions are occurring; production of peroxide would be indicated by a ratio less than 1:2. Preliminary observations of a "Pons-Fleischmann" cell indicate that far less oxygen is evolved at the anode than would be expected when compared to an identical electrolysis performed in acidic solution. Efforts to make quantitative measurements of gas yields are in progress at this time. Parallel measurements of neutron, tritium, gammas, or excess heat production give negative results.

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