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A Correction to a Well-Known Experiment Procedure in Physics, Electricity and Magnetism Labs JAVAD R. GATABI, HANU ARAVA, Physics Department, Texas State University at San Marcos, ZAHRA R. GATABI, Department of Pharmacy, Mazandaran University of Medical Sciences, Sari, Iran — The "Equipotential Surfaces and Electric Fields" is a well-known experiment in most Physics, electricity and magnetism labs. This experiment provides a clear understanding of equipotential surfaces around charged electrodes in a conducting solution. In many universities, the salt and water solution is used as the conducting solution and a DC power supply is used as the excitation voltage. Our study demonstrates that the application of the DC power source causes problems in final experiment's result due to water electrolysis, double-layer capacitance, Ohmic resistance and electrolytic saturation effects. This results in the potential variation in the water during the time, causing a time dependent measurement. Our study shows that the students plotted equipotential curves bend and deviate from the desired form and it makes them confused. The study proposes a developed setup for the experiment using a proper AC excitation signal with appropriate frequency and amplitude ranges. The result with this AC experiment setup is much closer to theoretically expected curves compared to the experiment with DC supply.

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