

LabNotebook

Bijan Varjavand

February 28, 2017

1 Objectives

The goal this lab was to measure capacitance values using an LCR meter, while changing properties of the material we were measuring. This would hopefully result in interesting data.

2 Setup

LCR meters and the materials were provided by the lab. We were also given copper tape, and RO and tap water were both provided.

2.1 Materials

We used firebrick.

2.2 Tools

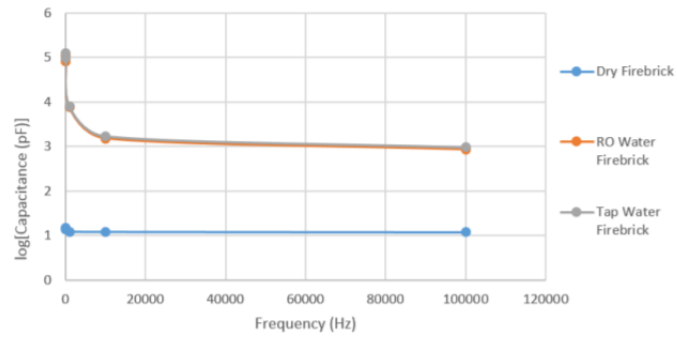
We used LCR meters and wires along with alligator clips.

3 Procedure

We took a single sample of firebrick and measured thickness. Attaching three differently sized copper pieces to one side, and covering the other side with copper tape. We then measured capacitance and dissipation factor at three different frequencies. We did this to the same sample after submerging it in RO water, and then regular water.

4 Results

An example of the trends we found from these measurements are shown below.



5 Observations

These results elucidates the relationship between capacitance and the existence of charge carriers in the material. This is shown by the greatly increased capacitance when we add water, which has natural hydronium and hydroxide ions.