Supporting Information

Low-Frequency Electrical Properties of Ice-Silicate Mixtures

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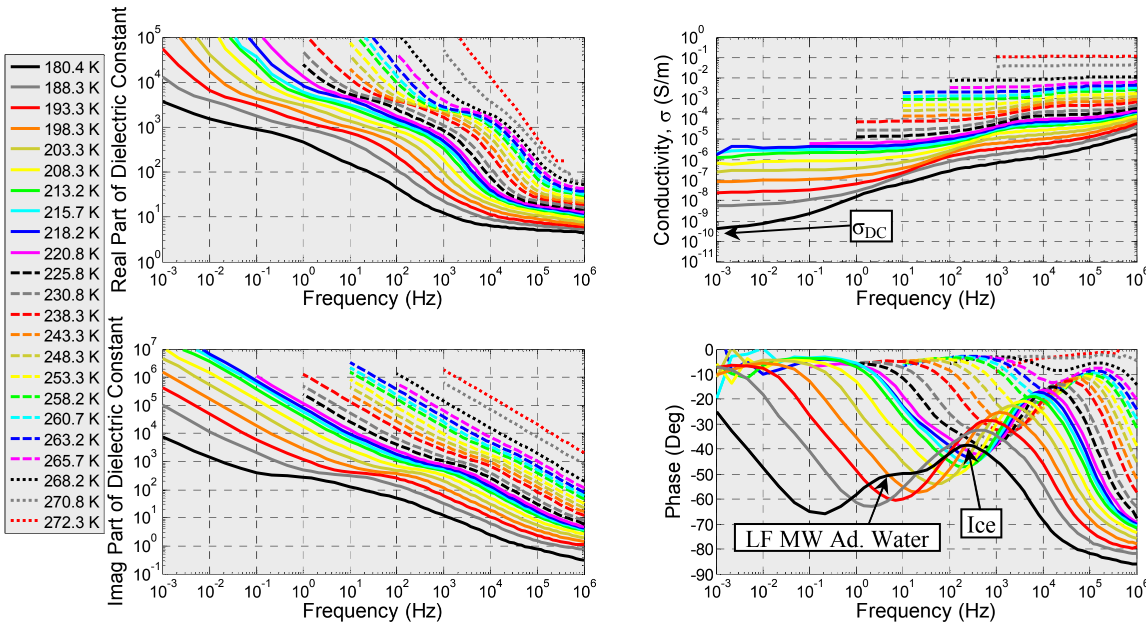

Figure S1. Electrical properties of 20 v% SAz mixed with 80 v% of 0.1 M CaCl2 as a function of temperature and frequency. This data set shows the DC conductivity, and the ice and low-frequency (LF) Maxwell-Wagner (MW) adsorbed water relaxations. The high frequency adsorbed water relaxation and the LFD are too small to be detected.

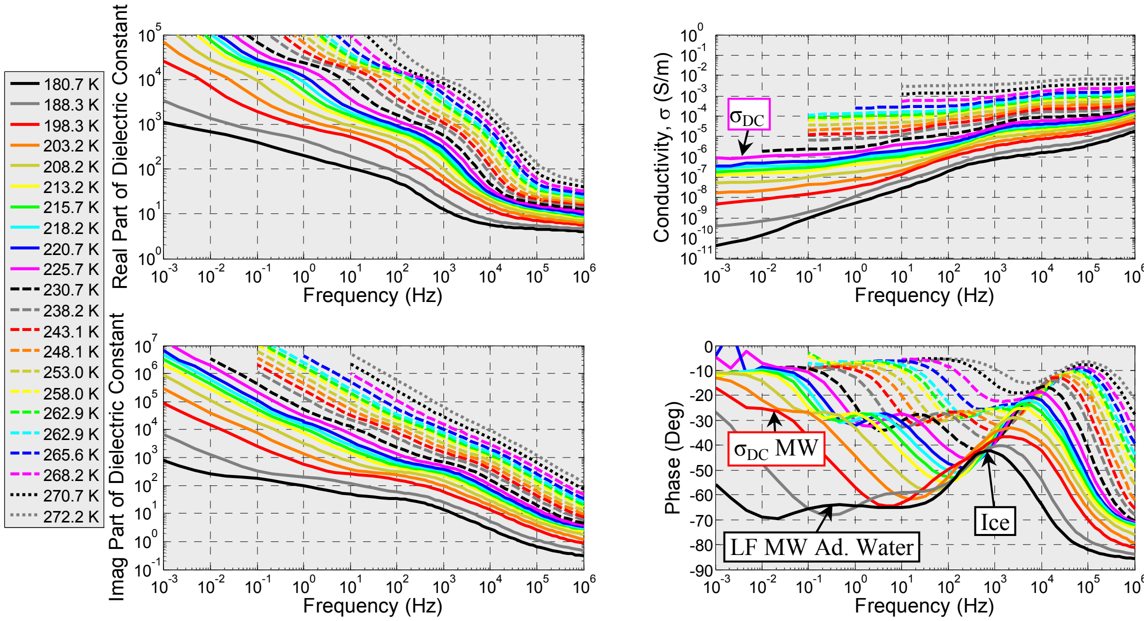

Figure S2. Electrical properties of 20 v% SAz mixed with 80 v% with 0.001 M CaCl2 as a function of temperature and frequency. This data set shows the DC conductivity, and the ice, LF MW adsorbed water, and MW due to the DC conductivity relaxations. The LFD is difficult to pick out in this data, however modeling with multiple Cole-Cole relaxations the LFD relaxation must be taken into account to ensure the proper fit. The high frequency adsorbed water relaxation is too small to be detected.

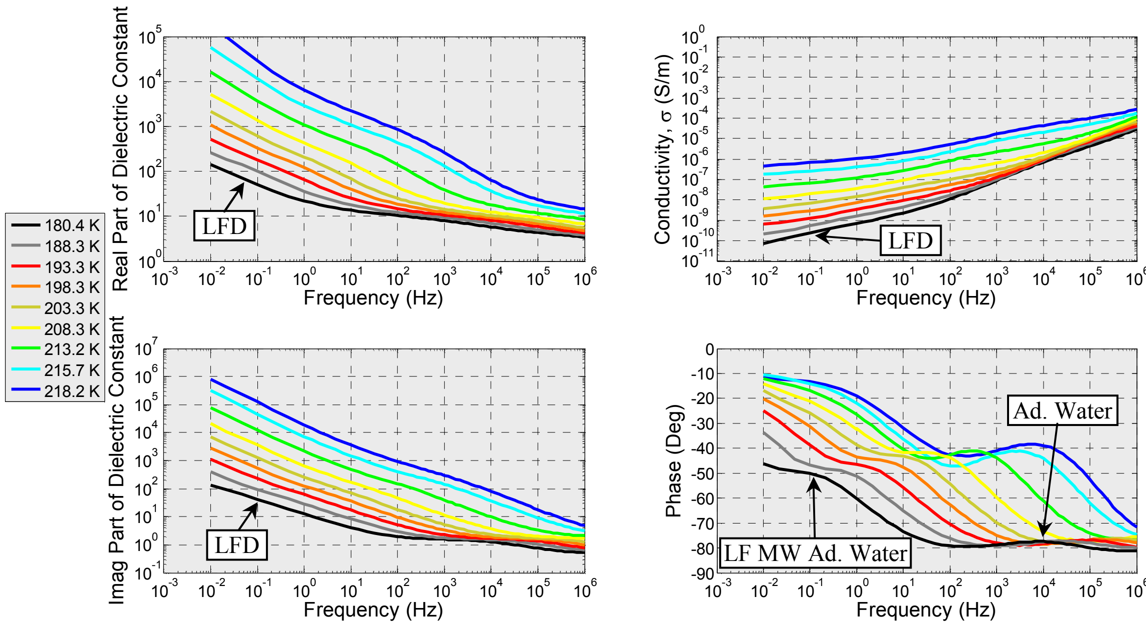

Fig S3. Electrical properties of 46 v% SAz-1 with 10 v% deionized water (3 monolayers) and 44 v% of air as a function of temperature and frequency. This data set shows the both adsorbed water and the LFD relaxations. Ice is not present as all water is adsorbed and there is no measurable DC conductivity.

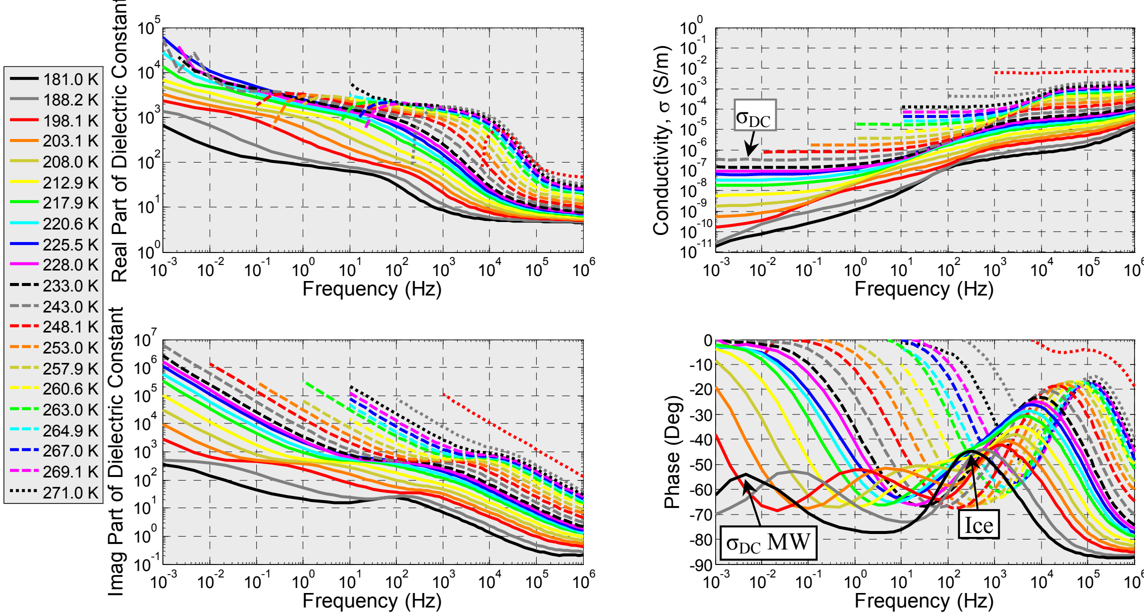

Figure S4. Electrical properties of 40 v% JSC-Mars-1 with 60 v% with 0.1 M CaCl2 as a function of temperature and frequency. This data set shows the DC conductivity, and the ice and Maxwell-Wagner due to the DC conductivity relaxations. The LFD is difficult to pick out in this data, however modeling with multiple Cole-Cole relaxations the LFD relaxation must be taken into account to ensure the proper fit. The adsorbed water relaxations are too small to be detected. The adsorbed water relaxations are detected when the ice relaxation is muted.

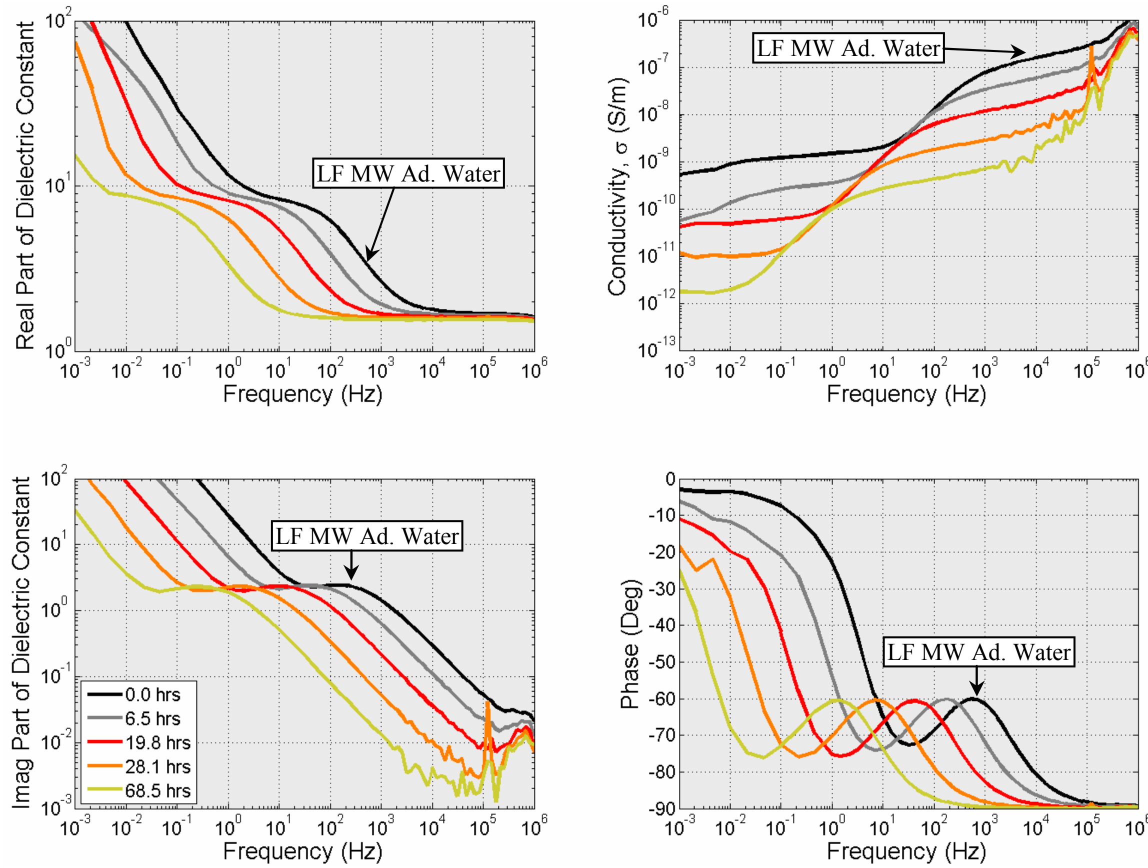

Figure S5. The electrical properties of CPG at 303.0±0.2 K with 3 monolayers of 1 mM $CaCl_2$ water were measured in a dry (relative humidity ~25%) atmosphere for 70 hrs. The legend shows the start time of the measurement with each measurement taken ~1.4 hrs to complete. The 3 ML of adsorbed water will evaporate away to slightly more than 1 monolayer. As this occurs, the low-frequency Maxwell-Wagner adsorbed water relaxation shifts to lower frequencies as the DC conductivity of the adsorbed water layer decreases.