Abstract Submitted
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Use of Propyl Sulfonic Acid Functionalized Silica to diminish the dehydration of CsH2PO4 at superprotonic transitions phase temperatures[1] ISRAEL MARTINEZ, CRISTIAN BOTEZ, JUAN LEAL, ALEX PRICE, ANDREA MONTGOMERY, SONAM LHAMO, University of Texas, El Paso — Cesium Dihydrogen Phosphate (CDP) exhibits a sudden, 1000-fold increase in protonic conductivity at when heated up to 235C from room temperature. However, CDP undergoes a chemical decomposition into a nonconductive oxide (cesium pyrophosphate) at these temperatures. Propyl Sulfonic Acid Functionalized Silica (PSAFS) is a well-known strong cation exchanger for polymers. A mechanical mixture based on a mole fraction of 0.7 CDP to 0.3 PSAFS was prepared for Electrochemical Impedance Spectroscopy (EIS) under ambient and humid conditions. EIS measurements were taken from 200C to 260C with a heating ramp of 2.5 C/min every 10 degrees and the sample was held at 260C for 20 hours. While at isotherm, impedance data was collected every hour. Conductivity values for the composite at hour 20 were 1.2 x10^{-04} Scm^{-1} in ambient conditions, and 2.1 x10^{-03} Scm^{-1} under humid conditions. Neat CDP produced values of 7.1 x10^{-07} Scm^{-1} and 5.9 x10^{-06} Scm^{-1} in ambient and humid conditions respectively. The composite out performed neat CDP with respect to time in both ambient and humid conditions

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