Abstract: Dataset for 'Understanding the AC conductivity and permittivity of trapdoor chabazites for future development of next-generation gas sensors'

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Dataset Abstract: Synthetic K^+ chabazite (KCHA), Cs^+ chabazite (CsCHA) and Zn^{2+} chabazite (ZnCHA) were synthesized and compared in order to relate the differences in their crystalline structures to their thermal stability (TGA data), moisture content (TGA data) and frequency dependent alternating current (AC) conductivity (AC conductivity heating and cooling data), permittivity (permittivity heating and cooling data) and phase angle (phase angle heating and cooling data) at a range of temperatures. Cation migration activation energies for KCHA (0.66 ± 0.10) eV, CsCHA (0.88 ± 0.01) eV and ZnCHA (0.90 ± 0.01) eV were determined (activation energy data). Good thermal stability of the materials was observed up to 710 °C (TGA data) and below 200 °C the electrical properties were strongly influenced by hydration level (conductivity, permittivity and phase angle data). Overall, it was determined that when either hydrated or dehydrated, KCHA had the highest conductivity and lowest cation migration activation energy of the three studied chabazites (activation energy data).

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