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Phase Transition Properties of Ferroelectric Ammonium Sulfate Dispersed in Mesoporous Silica[1] OZGE GUNAYDIN-SEN, RAMANJANEYULU SEEMALADINNE, KRISHNA KHAREL, Lamar University — Ammonium Sulfate, $(NH_4)_2SO_4$ (AS), a model ferroelectric, exhibits a structural phase transition at around 223 K. Recently, the dimensional downscaling of the ferroelectric materials (nanostructured ferroelectrics) led to the development and improvement of many electronic devices. Nanoscaling ferroelectric materials change many structural properties such as phase transition temperatures and dielectric constant as a result of size effect and interaction with the pore walls. We investigated thermal properties of bulk AS and after dispersing it in nanoporous silica, MCM-41. The heat capacity measurements over a temperature range of 180–300 K displayed an anomaly at around 223 K for AS, indicating a first-order structural phase transition. The transition enthalphy and entropy quantities were investigated for the bulk and the nanosized AS. Variable temperature infrared respose will also be discussed to further understand the phase transition mechanism in detail for the bulk and the nanocomposites.

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