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| Title | Influence of Sm and Fe Co-doping on Structural and Electrical Features of Yttrium Chromite Nanoparticles | | |
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| Abstract: Structural and electrical properties of perovskite-type Y1-xSmxCryFe1-yO3 nanoparticles synthesized by the sol–gel technique have been investigated. The X-ray diffraction pattern suggests that a pure phase was obtained for all the samples. The co-doped YCrO3 samples are highly crystalline, with an average crystallite size that varies between 31 and 35 nm. The details of the crystal structure of Sm-Fe co-doped nanoparticles were investigated by Rietveld refinement using Fullprof software. The electrical transport properties of YCrO3 and doped YCrO3 samples were investigated in the temperature range 303 K to 523 K, which shows that due to doping, the dc resistivity of the co-doped YCrO3 samples increases. The effect of doping on dc and ac activation energies was estimated. Temperature dependence of the power factor suggests that ac conductivity below 425 ± 5 K (region I) can be explained by CBH (correlated barrier hopping) model, and above 425 ± 5 K (region II), NSPT (non-overlapping small polaron tunneling) model is suitable. Around 450 K, a broad peak observed in the dielectric constant vs. temperature curve indicates the relaxor ferroelectric behavior in the co-doped YCrO3 nanoparticles. The asymmetric nature of the electric modulus spectra was explained by the modified KWW function. |  |
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