

Synthesis and characterization of nanostructured $\text{Ca}_{0.9}\text{Er}_{0.1}\text{MnO}_3$

Tijana B. Vlašković, Bojana Laban, Maja Milošević, Maria Čebela, Vladimir Dodevski, Milena Rosić



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Sinteza i karakterizacija nanostrukturnog $\text{Ca}_{0.9}\text{Er}_{0.1}\text{MnO}_3$

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Nanostrukturni $\text{Ca}_{0.9}\text{Er}_{0.1}\text{MnO}_3$ je sintetisan saharoza-nitratnom procedurom (SNP). Tokom ove metode sagorevanja su korišćene sledeće hemikalije: saharoza $\text{C}_{12}\text{H}_{22}\text{O}_{11}$ koja ima dvostruku ulogu i goriva i kompleksanta, kalcijum-nitrat tetrahidrat, mangan(II)-nitrat hidrat i erbijum(III)-nitrat pentahidrat. Nitrati metala i saharoza su kombinovani u njihovim odgovarajućim stehiometrijskim odnosima da bi se pripremio složeni oksid perovskitske nanostrukture. Dobijeni prah $\text{Ca}_{0.9}\text{Er}_{0.1}\text{MnO}_3$ je kalcinisan u temperaturnom opsegu od 800-1000°C tokom 15 min. Ispitani su veličina čestica, parametri rešetke, strukturne promene i površina. Za karakterizaciju sintetisanih uzoraka korišćena je diferencijalno termijska analiza (DTA), rendgenska difrakciona analiza (XRD), Furijeova transformaciona infracrvena spektroskopija (FTIR) i skenirajuća elektronska mikroskopija (SEM).

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Nanostructured $\text{Ca}_{0.9}\text{Er}_{0.1}\text{MnO}_3$ was synthesized by the sucrose-nitrate procedure (SNP). During this combustion method, sucrose $\text{C}_{12}\text{H}_{22}\text{O}_{11}$ which is both fuel and complexant and metal ions in the form of calcium nitrate tetrahydrate, manganese(II) nitrate hydrate, erbium(III) nitrate pentahydrate were used. Metal nitrates and sucrose were combined to prepare this nanostructured in their appropriate stoichiometric ratios. Obtained $\text{Ca}_{0.9}\text{Er}_{0.1}\text{MnO}_3$ powder was calcined in a temperature range of 800-1000 °C for 15min. Particle size, lattice parameters, structural changes, and specific surface area were investigated. DTA, X-ray diffraction (XRD), FTIR, and Field emission scanning electron microscopy (SEM) were used to characterize the synthesized samples at room temperature.

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