

عنوان مقاله:

Bismuth Pyromanganate: Hydrothermal and Solid State Synthesis, Characterization and Optical Properties

محل انتشار:

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خلاصه مقاله:

$\text{Bi}_2\text{Mn}_2\text{O}_7$ nano-powders were synthesized via a stoichiometric 1:1 Bi:Mn molar ratio hydrothermal method at 180°C for 48 h in a 1M NaOH aqueous solution; and solid state method, using $\text{Bi}(\text{NO}_3)_3 \cdot 5\text{H}_2\text{O}$ and MnO_2 as raw materials. The synthesized materials were characterized by powder X-ray diffraction (PXRD) technique. Also, the rietveld analysis was done in FullProf in profile matching mode. It was found that $\text{Bi}_2\text{Mn}_2\text{O}_7$ crystallizes in a cubic crystal structure with space group $Fd\bar{3}m$. The size and morphologies of the synthesized materials were studied by transmission electron microscopy (TEM) and field emission scanning electron microscopy (FESEM) techniques, respectively. The FESEM images showed that the synthesized $\text{Bi}_2\text{Mn}_2\text{O}_7$ has rod like structure in hydrothermal method and a mixture of rod and particle structures in solid state method. Also, BET-BJH analysis investigated for determination of pore size, pore volume, average particle size, pore width and surface area of the obtained materials. Also, photoluminescence spectra of the obtained materials were studied.

کلمات کلیدی:

$\text{Bi}_2\text{Mn}_2\text{O}_7$, Hydrothermal method, Solid state, nano materials, PXRD

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