

عنوان مقاله:

Synthesis of ZnO@S@Fe₃O₄ core-shell nanocomposite and its Uvshielding property

محل انتشار:

اولین کنفرانس ملی نانو از سنتز تا صنعت (سال: 1396)

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خلاصه مقاله:

Sunscreens are used to provide protection against adverse effects of ultraviolet UVB (290-320 nm) and UVA (320–400 nm) radiation. ZnO is used in sunscreens. In this work, we report synthesis of ZnO@S@Fe₃O₄ to improve UV protection of sunscreen. First, each of nanoparticles were synthesized by hydrothermal method and XRD pattern revealed the formation of compounds. Then ZnO@S core-shell synthesized by a sonochemical method. At the end, Sulfur nanoparticles were added. The XRD, IR, SEM, EDXA were used to characterize the compounds. In characterization, IR peaks showed expected vibration for functional groups. For example in ZnO@S@Fe₃O₄ bands in 566cm⁻¹, 481cm⁻¹ and 1027cm⁻¹ attributed to Fe-O vibration, Zn-O and monoclinic sulfur respectively. 25.39%wt Fe, 60.69%wt Zn and 5.01%wt S showed EDXA results. SEM showed that the prepared powder are made of spherical shape particles with an average size of about 86.7 nm in the surface. The compound was used in sunscreen. Some tests like uniformity, determining pH, temperature changes and microbial control sample was performed. The most important results are: increased absorption, fading and thermal stability compared to similar sunscreens. The results demonstrate that ZnO@S@Fe₃O₄ core-shell nanocomposite are good candidate for sunscreen.

کلمات کلیدی:

Core-Shell, nanocomposite, Zinc oxide, Hydrothermal, Sunscreen

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