

Cerium oxide UV filter obtained by sonochemical synthesis as a possible additive for coating polymers

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Cerium based materials have been employed as inorganic UV filter in a wide range of products such as cosmetics (sunscreen, shampoos, lotions etc), glass, paints, varnish and other. As additive in polymers, a considerable small number of papers have reported the introduction of cerium oxide to avoid the photodegradation, the loss of mechanical properties and yellowing of polymers caused by solar radiation.¹ The main problem to add cerium oxide nanoparticles in polymeric bulk is maintaining the homogeneous dispersability of the particles, usually the nanoparticles agglomerate causing an inefficient photoprotection. To avoid this, sonochemical syntheses were employed to prepare nanosized cerium oxides with good homogeneity morphology and size, and well dispersible in polymeric systems.² Herein, cerium oxides were synthesized assisted by ultrasonic, stoichiometric amounts of cerium nitrate and sodium hydroxide were slowly added in propyleneglycol using a peristaltic bomb. Then, the system was submitted to ultrasonic in different times (0, 5, 10 and 30 min) and kept for 4 h at 60 °C. Finally, the nanoparticles were separated by centrifugation, washed several times and dried at 100 °C for 24 h. Cerium oxides nanoparticles were characterized by XRD, Raman, DRS (Figure 1), and SEM. The materials were also evaluated concerning their photocatalytic activity. The results collect until here confirm the UV absorption ability and suggest the capacity to apply them in polymers, which consist our future tests.

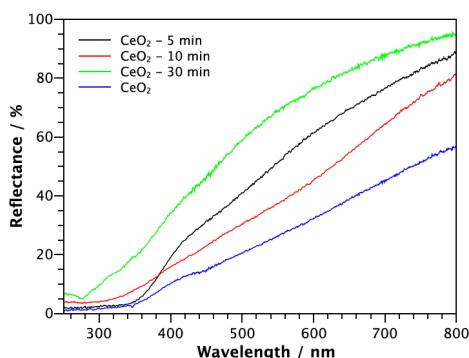


Figure 1: Diffuse Reflectance Spectra of cerium oxides prepared associated with sonochemical method.

¹ Lima, J. F., de Sousa Filho P. C., Serra, O. A., Ceram. Inter. 2016, 42, 7422.

² Zhang, D., Du, X., Shi, L., Gao, R. Dalton Trans. 2012, 41, 14455

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