In this work we present the synthesis and luminescence properties of Hafnium silicate using the spray pyrolysis technique, hollow spherical particles with a diameter ranging a few nanometers to a couple of microns were obtained. The shells, nevertheless, have a few nanometers thick and the distribution of diameters have a maximum of around 700nm. XRD analysis shown that the particles are mainly composed by nanocrystals of hafnium oxide domains with sizes of about 14.36nm. The luminescent properties of the material allow it to be excited with a wavelength of 270nm and have a maximum of emission at 545nm and another at 973nm with this same excitation, it is also possible to excite with a wavelength of 980nm and obtain a maximum of excitation at 545nm which is known as the upconversion process. When the decay times were measured and adjusted, the cooperative process of excitation and emission on hafnium silicate between terbium and ytterbium was confirmed. So these properties can make this material an excellent candidate to function both as a biological marker and to increase the efficiency of a solar cell.

Keywords: Luminescence, Hafnium silicate, Biological marker

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