Functionalization of $Y_2O_3:Sm^{3+}$ and $Y_2O_3:Tb^{3+}$ materials

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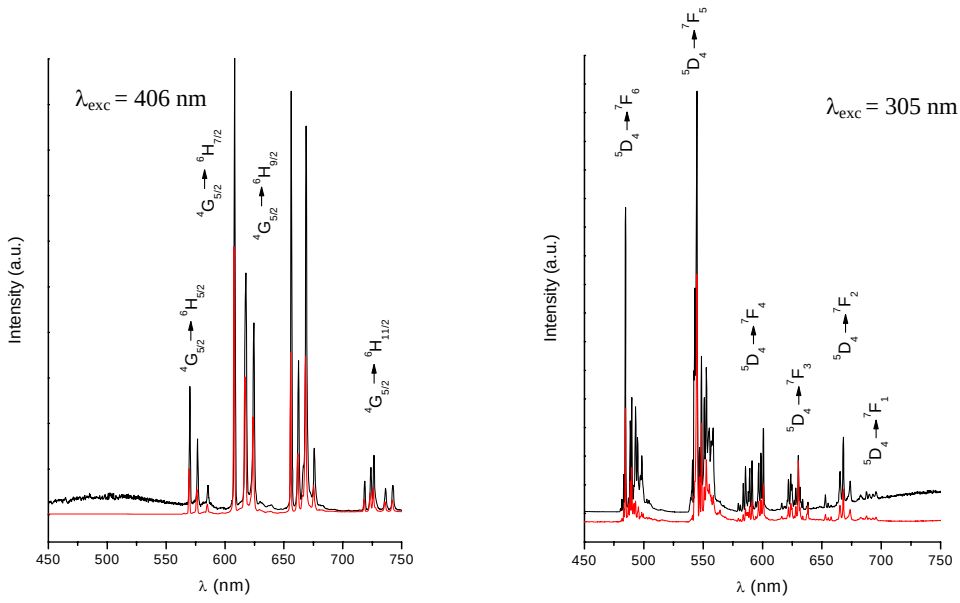
Rare earth complexes and oxides have been widely used as markers in all kinds of bioassays. Their long emission lifetime allows working with a time delay. Therefore, interference by short-lived background emission and scattering light can be suppressed [1].
We proposed the preparation of particles containing samarium and terbium as new luminescent labels. $Y_2O_3:Sm^{3+}$ and $Y_2O_3:Tb^{3+}$ materials were obtained by combustion method using glycine as fuel [2]. Particles containing Sm^{3+} and Tb^{3+} ions were capped by an amino-functionalized silica layer using microwave oven technique.
X-ray and IR were used to characterize the oxide materials. Functionalization of the particles was controlled using two approaches: photoluminescence investigation with monitoring in the rare earth ions and quantification of primary amines located in the material using the modified ninhydrin method. Fig.1 shows emission spectra of these particles.



a) b)

Fig.1. Emission spectra of a) Sm^{3+} and b) Tb^{3+} doped Y_2O_3 compound before (—) and after (—) functionalization.

Keywords: Functionalization, Samarium, Terbium, Luminescence.
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