Optical properties of the Quantum Cascade nanocrystalline phosphor $SrAl_{12}O_{19}:Pr^{3+}$

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We offer a comparative study between the optical properties of nanocrystalline and bulk quantum cascade phosphor, $SrAl_{12}O_{19}:Pr^{3+}$ (SAP) [1]. No differences in the excited state properties were determined. The interaction of the $Pr^{3+}4f5d$ state with the conduction band of the host lattice is held responsible for the low quantum efficiency of this phosphor. In Figure 1 we have shown the room temperature emission spectrum of the nanocrystalline SAP phosphor. Figure 2 shows the room temperature decay curve of the ^1S_o emission in this sample. These results are in agreement with those obtained on the large sized material.

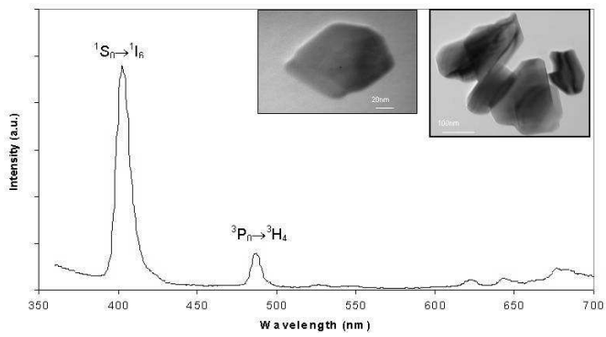

Figure 1: TEM and emission spectra (λ_{ex}=200 nm) for nano-$SrAl_{12}O_{19}$

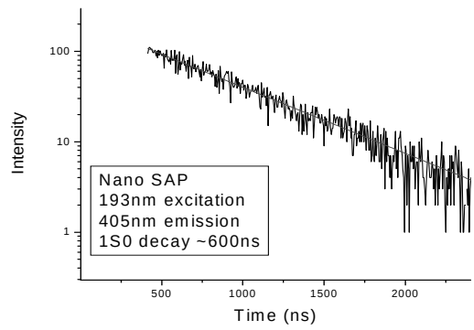

Figure 2: Room temperature decay curve of nanocrystalline SAP

REFERENCES

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