

FLUORESCENCE MEASUREMENTS OF Mn^{2+} IN THE FLUORINE
 $SrMnF_4$: COMPARISON WITH CaF_2 HEAVILY DOPED Mn^{2+}

A. Aamili, J. Metin, M. El-Ghozzi, R. Mahiou and J. C. Cousseins

Laboratoire de Chimie des Solides (URA 444), Université Blaise Pascal
 (Clermont-Ferrand) et ENSCCF, 63177 Aubière Cédex (France)

The study of the SrF_2 - MnF_2 binary systems shows at high temperature the existence of a compound the stoichiometry of which is 1-1. A single crystal study reveals a fluorine like structure.

At 77 K, upon excitation with a pulsed nitrogen laser ($\lambda = 337.1$ nm) the ${}^4T_{1g} ({}^4G) \rightarrow {}^6A_{1g} ({}^6S)$ fluorescence of the Mn^{2+} ion lies in the orange-red wavelength range with a maximum peak at about 608 nm in this compound.

The fluorescence properties of $SrMnF_4$ are similar with those of $CaF_2:Mn^{2+}$ (prepared at 870°C) when the Mn^{2+} ions concentration is higher than 25 % at 300 K. In both compounds the excitation spectra of the ${}^4T_{1g} ({}^4G) \rightarrow {}^6A_{1g} ({}^6S)$ fluorescence recorded at 77 K are characteristic of an O_h local symmetry for Mn^{2+} .

In $CaF_2:Mn^{2+}$ the well known green emission is observed at room temperature until the Mn^{2+} concentration reaches 20 %. Beyond this composition, the ${}^4T_{1g} ({}^4G) \rightarrow {}^6A_{1g} ({}^6S)$ emission becomes yellow (C = 22.5 %) then its maximum peak lies at about 608 nm (like in $SrMnF_4$) for the composition limit of 40 %.