

## MS14-P11 | SYNTHESIS OF CALCIUM AND STRONTIUM RARE-EARTH ALUMINATES AND ITS USE AS HOST LATTICE FOR LEDs

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Long luminescent material based on  $M\text{RAIO}_4$  and  $\text{MR}_2\text{O}_4$  ( $M = \text{Ca, Sr, Ba}$ ;  $R = \text{Rare Earth Elements}$ ) as host lattice are gaining more interest due to their smooth emission spectra and long lifetimes.

The abstract reports on the results of studies on solid solution of  $\text{MEu}_{2-x}\text{Al}_x\text{O}_4$  ( $M = \text{Sr, Ba}$ ) and monophasic synthesised  $\text{MRAIO}_4$  – phases ( $M = \text{Ca, Sr, Ba}$ ;  $R = \text{La, Nd, Sm, Eu, Gd, Dy, Y and Yb}$ ). The compounds prepared using sol gel based Pechini method are studied by powder X-ray diffraction analysis, IR, TG and REM. Furthermore,  $\text{CaEuAlO}_4$  and  $\text{SrEuAlO}_4$  are doped with  $\text{Dy}^{3+}$  and  $\text{Sm}^{3+}$  to study the potential use in white light emitting diodes (W-LED).

The study of the system of  $\text{SrEu}_{2-x}\text{Al}_x\text{O}_4$  showed, that when  $x = 1$  there exists an intermediate phase with composition  $\text{SrEuAlO}_4$ . Phases with composition  $\text{MRAIO}_4$  ( $M = \text{Ca, Sr}$ ;  $R = \text{Nd, Sm, Eu, Gd, Dy, Y and Yb}$ ), which are isotopic to  $\text{SrEuAlO}_4$ , are not all stable, depending on the ionic size of alkaline earth and rare earth elements (unstable are  $\text{SrDyAlO}_4$ ,  $\text{SrYAlO}_4$  and  $\text{SrYbAlO}_4$ )

The present study demonstrates the synthesis of monophasic  $\text{MRAIO}_4$  ( $M = \text{Ca, Sr, Ba}$ ;  $R = \text{La, Nd, Sm, Eu, Dy, Y and Yb}$ ) by sol gel based Pechini method at sintering temperature ( $1300^\circ\text{C}$ , 2-4h).