Long luminescent material based on MRAIO₄ and MR₂O₄ (M = Ca, Sr, Ba; R = 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 MEu₂₋ₓAlₓO₄ (M = Sr, Ba) and monophasic synthesised MRAIO₄ – phases (M = Ca, Sr, Ba: R = 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, CaEuAlO₄ and SrEuAlO₄ are doped with Dy³⁺ and Sm³⁺ to study the potential use in white light emitting diodes (W-LED).

The study of the system of SrEu₂₋ₓAlₓO₄ showed, that when x = 1 there exists an intermediate phase with composition SrEuAlO₄. Phases with composition MRAIO₄ (M = Ca, Sr; R = Nd, Sm, Eu, Gd, Dy, Y and Yb), which are isotypic to SrEuAlO₄ are not all stable, depending on the ionic size of alkaline earth and rare earth elements (unstable are SrDyAlO₄, SrYAlO₄ and SrYbAlO₄)

The present study demonstrates the synthesis of monophasic MRAIO₄ (M = Ca, Sr, Ba: R = La, Nd, Sm, Eu, Dy, Y and Yb) by sol gel based Pechini method at sintering temperature (1300°C, 2-4h).