# SYNTHESIS $SrAl_2O_4:Eu^{2+},Dy^{3+}$ PHOSPHOR BY USING SOLUTION COMBUSTION METHOD

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## ABSTRACT

### SYNTHESIS $SrAl_2O_4:Eu^{2+},Dy^{3+}$ PHOSPHOR BY USING SOLUTION COMBUSTION METHOD

Strontium aluminate doped with $Eu^{2+}$ and $Dy^{3+}$ were prepared by using solution combustion method. To synthesize $SrAl_2O_4$ : $Eu^{2+}$, $Dy^{3+}$ phosphor, $Sr(NO_3)_2$ and $Al(NO_3)_3.9H_2O$ were used as starting material while $Eu_2O_3$ and $Dy_2O_3$ were used as activator. The fuel used for combustion process was urea ($CH_4N_2O$). The structural properties were measured by using X-ray diffraction (XRD) and Fourier transform infrared (FTIR) spectroscopy. The structure of the $SrAl_2O_4:Eu^{2+},Dy^{3+}$ was found to be monoclinic with space group $P2_1$ with crystallite size around 22.43 nm. Based on FTIR, the functional group including vibrational and bending modes exist in sample were identified. The optical properties of $SrAl_2O_4:Eu^{2+},Dy^{3+}$ were studied by using photoluminescence (PL) and Ultraviolet-Visible (UV-Vis). $SrAl_2O_4$: $Eu^{2+}$, $Dy^{3+}$ emits green light when the peak is at 522 nm and confirmed with CIE. $SrAl_2O_4:Eu^{2+},Dy^{3+}$ has around 5.3865 eV direct energy band gap based on UV-Vis analysis. This nanophosphor is very useful in industry since it has afterglow effect.