Conclusion:

- Nano Particles of La_2O_3 and Ln^{3+}: La_2O_3 are successfully synthesized by Aloe Vera Gel assisted precipitation method. The average size of synthesized particles was around 60 nm.
- The emission of 1% Gd^{3+}: La_2O_3 falls in UVB region while for 1% Ce^{3+}: La_2O_3 & 1% Pr^{3+}: La_2O_3, it is in UVA region. Both, UVA and UVB emission has been recorded in 1% Ce^{3+} - 1% Gd^{3+}: La_2O_3, 2% Ce^{3+} - 1% Gd^{3+}: La_2O_3. In 1% Pr^{3+} - 1% Gd^{3+}: La_2O_3 and 2% Pr^{3+} - 1% Gd^{3+}: La_2O_3, the emission has been recorded in the visible region with high intensity sharp line due to the energy transfer from Gd^{3+} ion to Pr^{3+} ion and thus has the potential to serve as LED phosphor of cyan color. The parameters like redshift D, centroid shift ε_c and crystal field splitting ε_{cfs} have been calculated for Ce & Ce – Gd based La_2O_3 compounds.
- From the comparative study of structural data obtained from the XRD spectra of the three synthesis techniques for the preparation of Lanthanum oxysulfide, the furnace combustion technique without sulfur powder as the flux was found to give the best results. It has the potential to become an industrial friendly technique.
- The nanoparticles of the pristine and doped Lanthanum Oxyfluoride were successfully synthesized by precipitation method using Bael leaf extract also known as Aegle marmelos gel as bio-surfactant. The average size of synthesized particles is in the range of 34 nm to 88 nm.