

Conclusions

From overall results, the following conclusions can be made.

1. The characterisation of commercial lamp phosphors using XRD technique is comparable with the published literature.
2. The lumen output and colour coordinates are within the Indian standards.
3. Hydro based coating is supposed to be the best and cheapest, but there is no mechanism to control the coating thickness.
4. Finer powders with average particle size of 5 microns give better lumen output. However, in the present study, all the phosphors were found to have an average particle size of around 12 microns, which could lead to lower lumen output. Therefore, preparation of phosphor of particle size around 5 micron would ensure better lumen output.
5. Based on the TSL - EPR studies, the TL is attributed to PO_4^{2-} radical in Calcium halophosphates, while in case of synthesised phosphors, the TL can be attributed to PO_4^{2-} radical as well as F^{++} centre.
6. The TSL spectrum proposes the luminescence centres to be the dopant ions, either isolated or in aggregates.
7. The synthesised phosphor having the highest Quantum efficiency was found to be $\text{LaPO}_4:\text{Ce}_{0.02}\text{Tb}_{0.01}$. Cerium acts as a sensitiser and Terbium as activator.