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Strontium Aluminate based aerogel phosphors for the enhanced afterglow properties

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Owing to the excellent afterglow properties of SrAl2O4:Eu2+Dy3+, there have been several efforts put into the synthesis of this material. Conventionally, this was synthesized via solid state method to obtain bulk scale materials. Recently, nanoscale-based Strontium Aluminates have also grabbed the attention of many researchers. This is due to the size induced changes in the structural, optical and electrical properties of the nanophosphors. However, there is some controversy in the literature with the context of phosphorescence for this material. Some of the groups strongly believe that the afterglow enhances for the nanoscale materials in comparison to the bulk ones due to the confinement of most activators at the surface and enhanced trap depth reasons. On the other hand, there are other groups which suppose that quenching of luminescence occurs for such nanomaterials due to enhanced number of defects. To clearly understand the current controversy and enhance further the afterglow properties, we decided to assemble these nanoscale materials and form it into 3D mesoporous solids or aerogels. Aerogels are expected to ameliorate the phosphorescence of this material as they are highly porous (giving rise to mid gap states, hence better afterglow), along with the higher surface area (leading to better absorption properties, henceforth emission). Considering these advantages, SrAl2O4:Eu2+Dy3+ based aerogels will be synthesized and post-processed to obtain high quantum yield nanophosphors.

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