

## Electronic Supplementary Information

### Enhanced thermal degradation stability of $\text{Sr}_2\text{Si}_5\text{N}_8:\text{Eu}^{2+}$ phosphor by ultra-thin $\text{Al}_2\text{O}_3$ coating through Atomic Layer Deposition technique in a Fluidized Bed reactor

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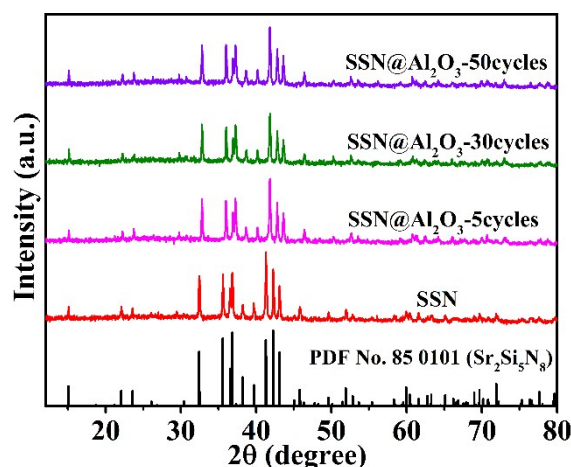


Fig. S1 XRD patterns of SSN@Al<sub>2</sub>O<sub>3</sub>@100°C with different number of cycles.

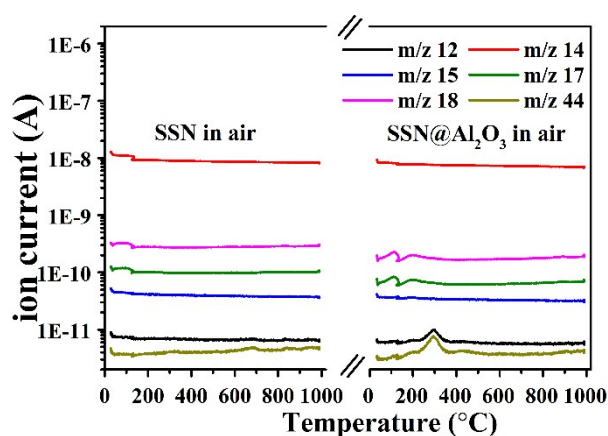


Fig. S2 TGA/MS of SSN and SSN@Al<sub>2</sub>O<sub>3</sub>@30°C. Species with different ratios of mass to charge (m/z) appear within the temperature range. H<sub>2</sub>O and OH groups are confirmed by the m/z 18 and 17. Carbon and carbon dioxide are determined by the m/z 12 and 44.

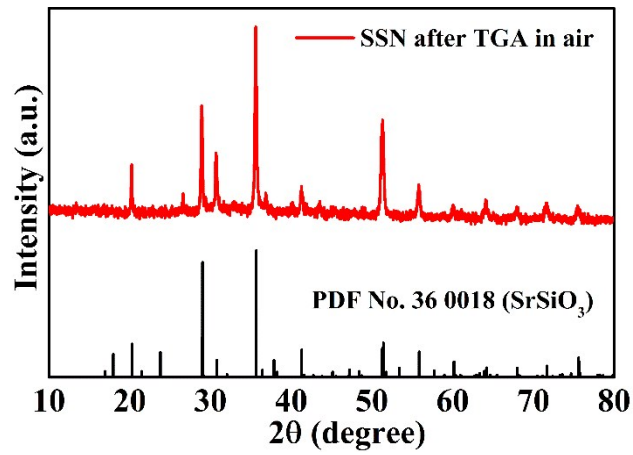


Fig. S3 XRD pattern of SSN after TGA measurement in air.  $\text{SrSiO}_3$  is formed.

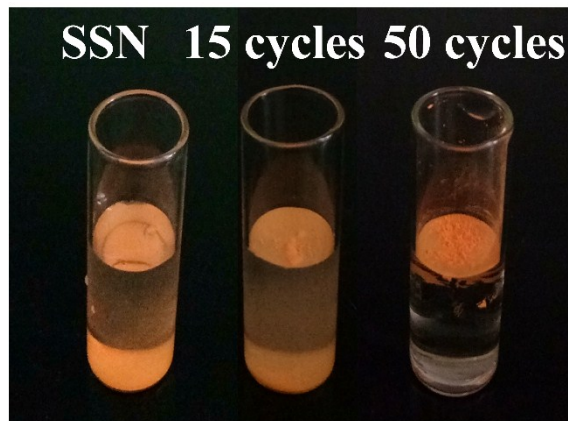


Fig. S4 Photograph of SSN and  $\text{SSN@Al}_2\text{O}_3@100^\circ\text{C}$  with different number cycles in water.

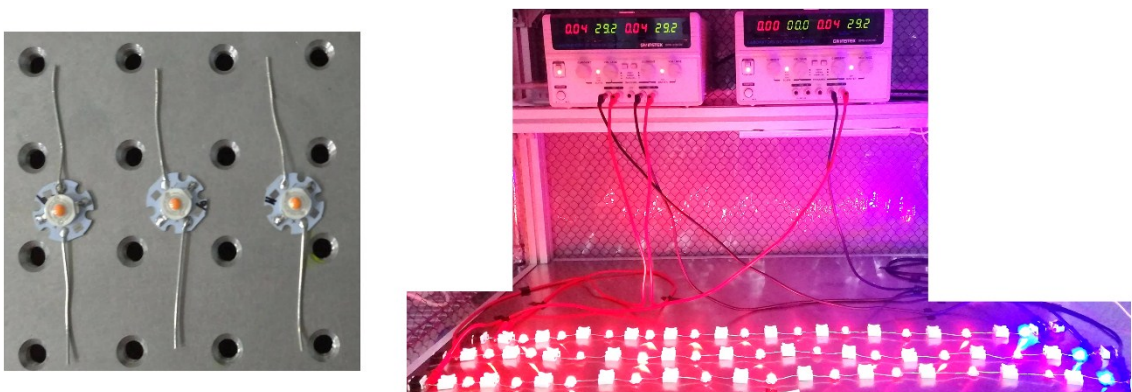


Fig. S5 Photographs of the fabricated LEDs and the aging test.