Electronic Supplementray Information (ESI)

Tunable Emission Color and Mixed Valence State via the Modified Activator Site in AlN-Doped Sr3SiO5:Eu Phosphor

Wei Li,[a] Jin Wang,[a] Haoran Zhang,[a] Yingliang Liu,[a,*] Bingfu Lei,[a,*] Jianle Zhuang,[a] Jianghu Cui,[a] Mingying Peng[b] and Yue Zhu[a]

[a] *Guangdong Provincial Engineering Technology Research Center for Optical Agriculture, College of Materials and Energy, South China Agricultural University, Guangzhou 510642, P. R. China*

[b] *The State Key Laboratory of Luminescent Materials and Devices, School of Materials Science and Engineering, South China University of Technology, Guangzhou 510640, P.R. China*

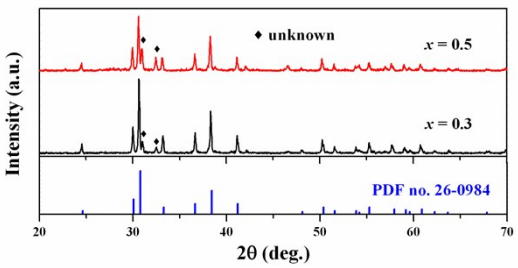

Figure S1. XRD patterns of $Sr_{2.97}Si_{1-x}Al_xO_{5-2x}N_x$:0.03Eu ($x$ = 0.3 and 0.5), together with the standard data for Sr_3SiO_5 as reference.

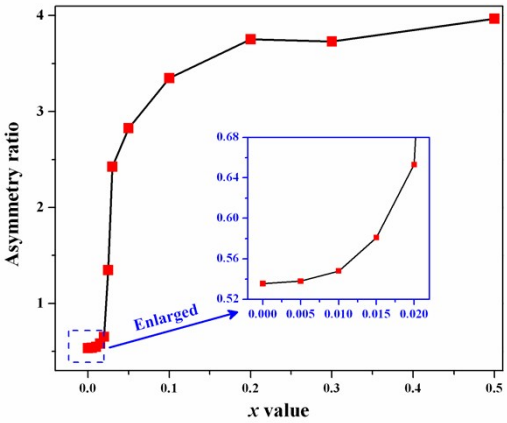

Figure S2. Asymmetry ratio of the emission intensities of Eu^{3+} transitions of $^5D_0 \rightarrow {}^7F_2$ and $^5D_0 \rightarrow {}^7F_1$ as a function of x values.

* Corresponding author: tleibf@scau.edu.cn (B. Lei).

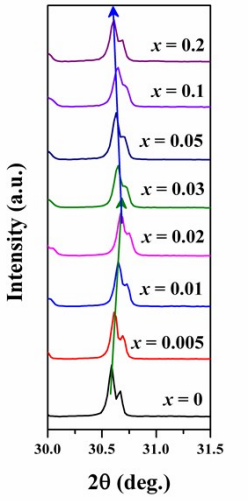

Figure S3. Detailed XRD patterns from 30° to 31.5° of $Sr_{2.97}Si_{1-x}Al_xO_{5-2x}N_x$:0.03Eu ($x$ = 0-0.2).

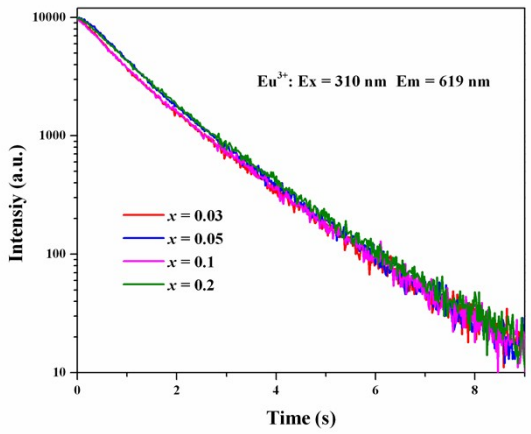

Figure S4. Decay curves (λ_{ex} = 310 nm, λ_{ex} = 619 nm) of Eu in $Sr_{2.97}Si_{1-x}Al_xO_{5-2x}N_x$:0.03Eu ($x$ = 0.03, 0.05, 0.1 and 0.2).

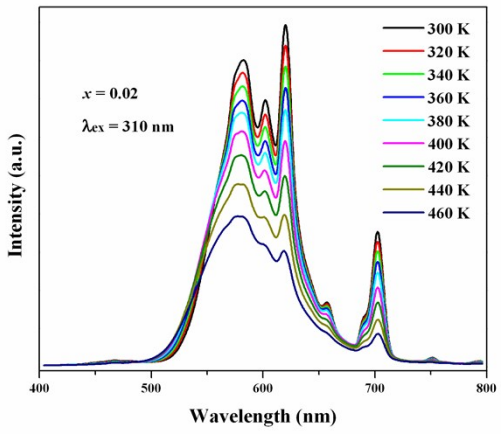

Figure S5. PL (λ_{ex} = 310 nm) spectra of $Sr_{2.97}Si_{1-x}Al_xO_{5-2x}N_x$:0.03Eu ($x$ = 0.02) under various temperatures (300-460 K).