

Supporting information

Synthesis and photoluminescence of Mn⁴⁺ activated ternary-alkaline fluoride K₂NaGaF₆ red phosphor for warm-white LED application

Shijie Qiu, Hengwei Wei, Mengmeng Wang, Shuai Zhang, Yang Zhou, Ling Xu, Xiaoming Wang*, Huan Jiao*

Key Laboratory of Macromolecular Science of Shaanxi Province, School of Chemistry & Chemical Engineering,

Shaanxi Normal University, Xi'an 710062, Shaanxi Province, People's Republic of China

* Corresponding author. Tel.: +86 29 81530766; Fax: +86 29 81530727.

E-mail address: xmwang@snnu.edu.cn

jiaohuan@snnu.edu.cn

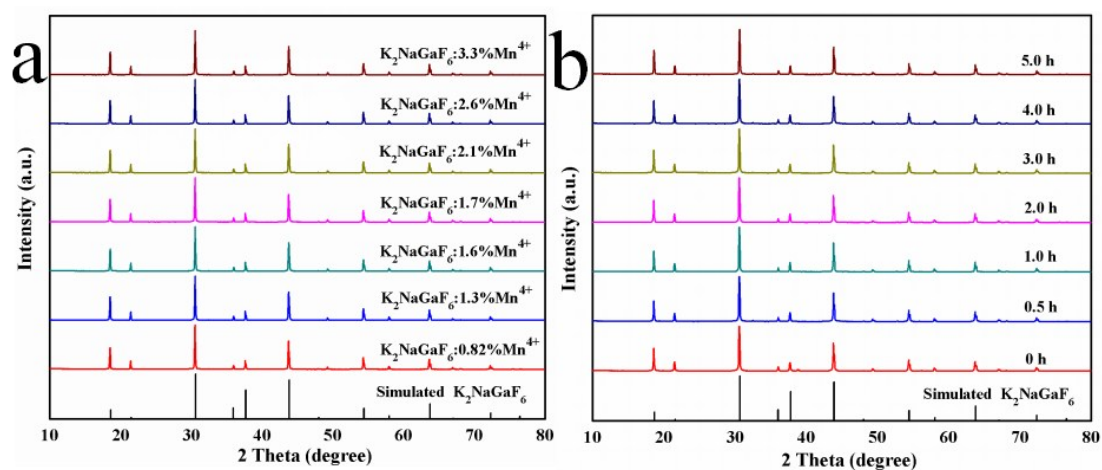


Fig. S1. (a), (b) XRD patterns with different doping concentration and aging time of

$\text{K}_2\text{NaGaF}_6:\text{Mn}^{4+}$, respectively.

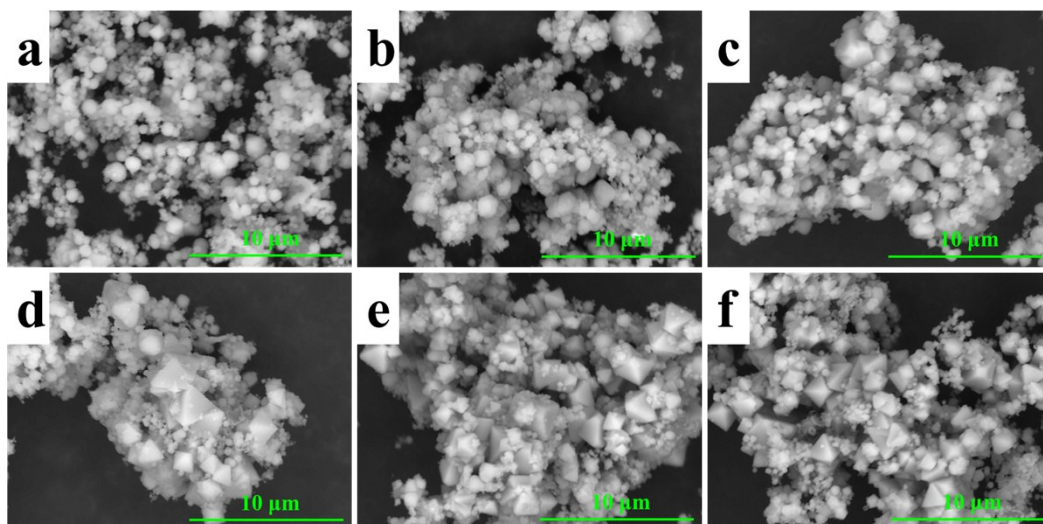


Fig. S2. SEM images of $\text{K}_2\text{NaGaF}_6:\text{Mn}^{4+}$ phosphors prepared with different aging time:

(a) 0 h, (b) 0.5 h, (c) 1 h, (d) 3 h, (e) 4 h, (f) 5 h.

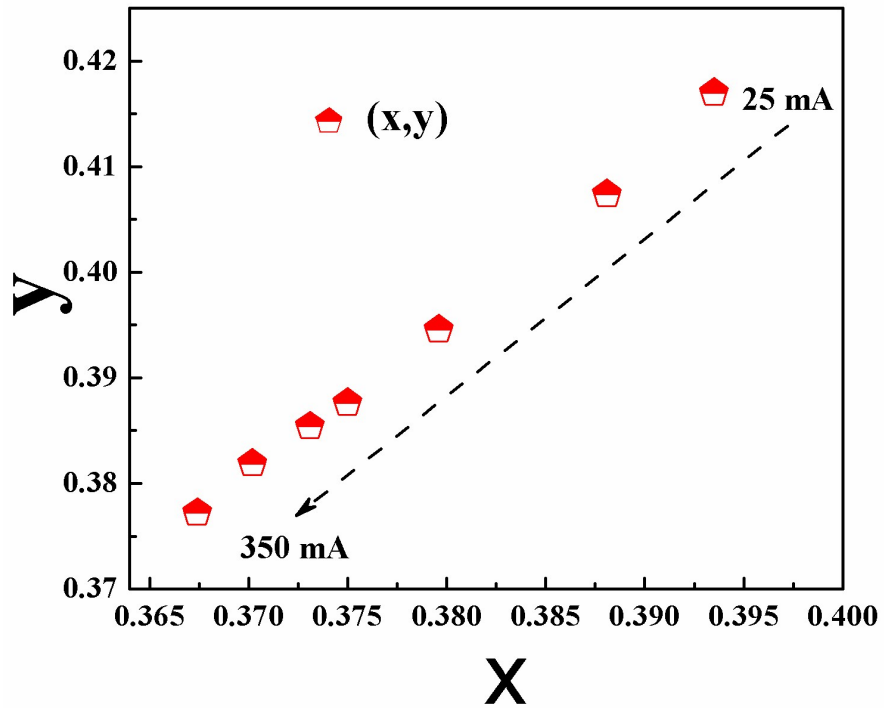


Fig. S3. CIE chromaticity coordinates of $K_2NaGaF_6:Mn^{4+}$ from 25 mA to 350 mA.