Electronic Supplementary Information

Abnormal site occupancy and high performance in warm WLEDs of a novel red phosphor $NaHF_2:Mn^{4+}$ synthesized at room temperature

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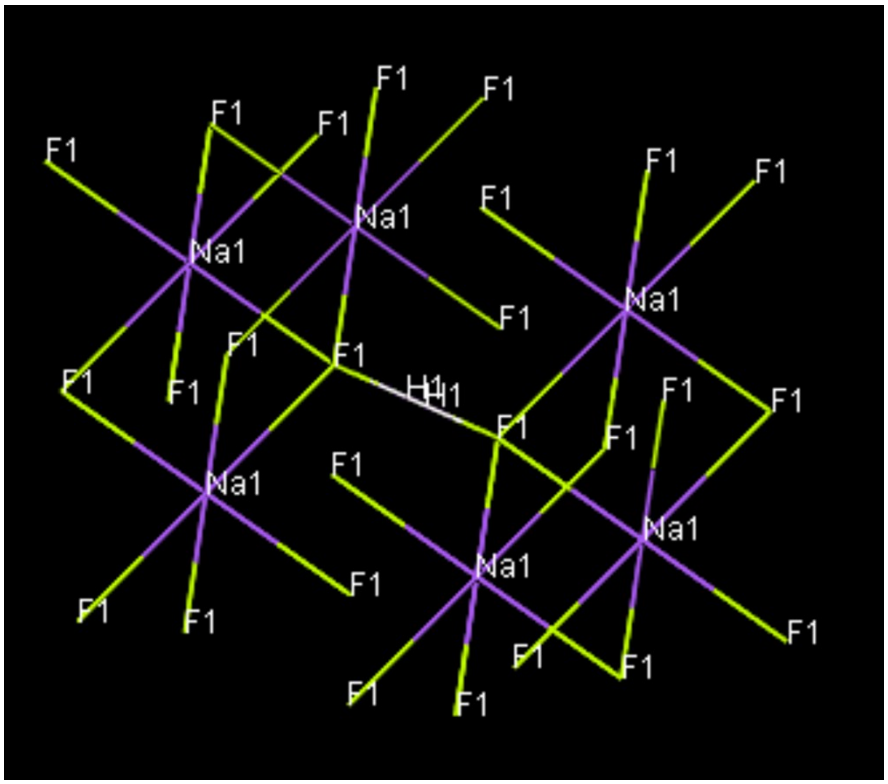

Figure S1. Structure diagram of solid $NaHF_2$ drawn by software Mercury 1.4.1

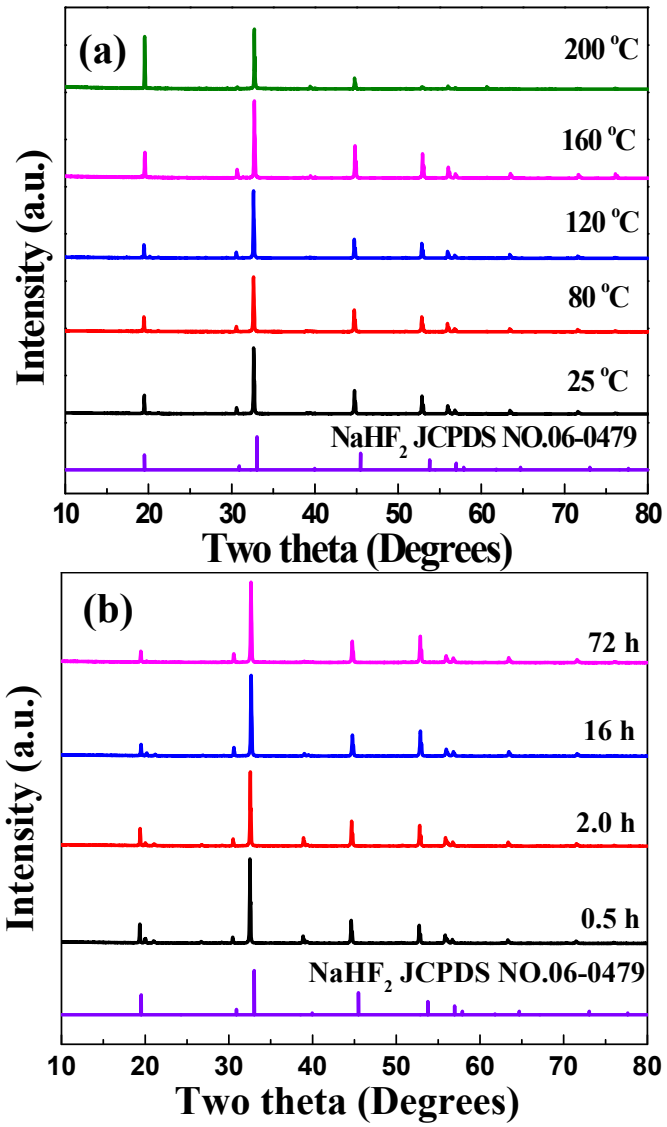

Figure S2. X-ray diffraction patterns of $NaHF_2:Mn^{4+}$ samples obtained under different synthesis conditions compared with the standard JCDPS NO. 06-0479: (a) reaction temperature, (b) reaction time. (All synthetic parameters were kept constant except for the examined variables.)

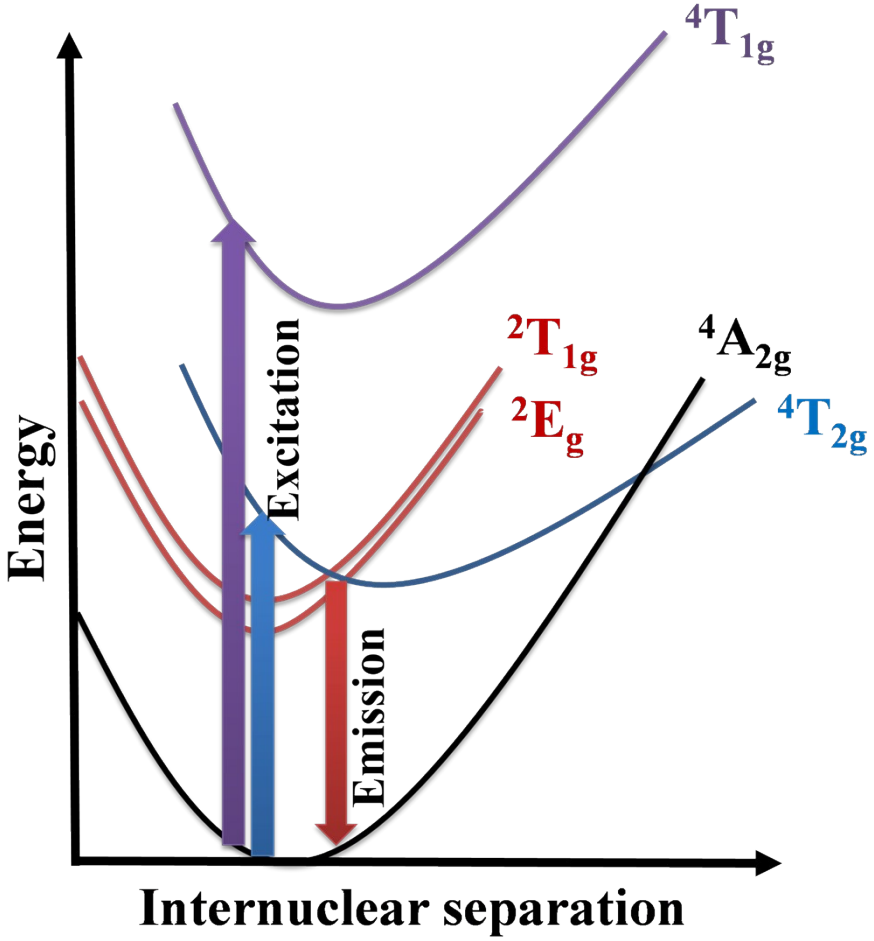

Figure S3. The configurational coordinates diagram of the energy states of Mn^{4+} located at the center of octahedron.

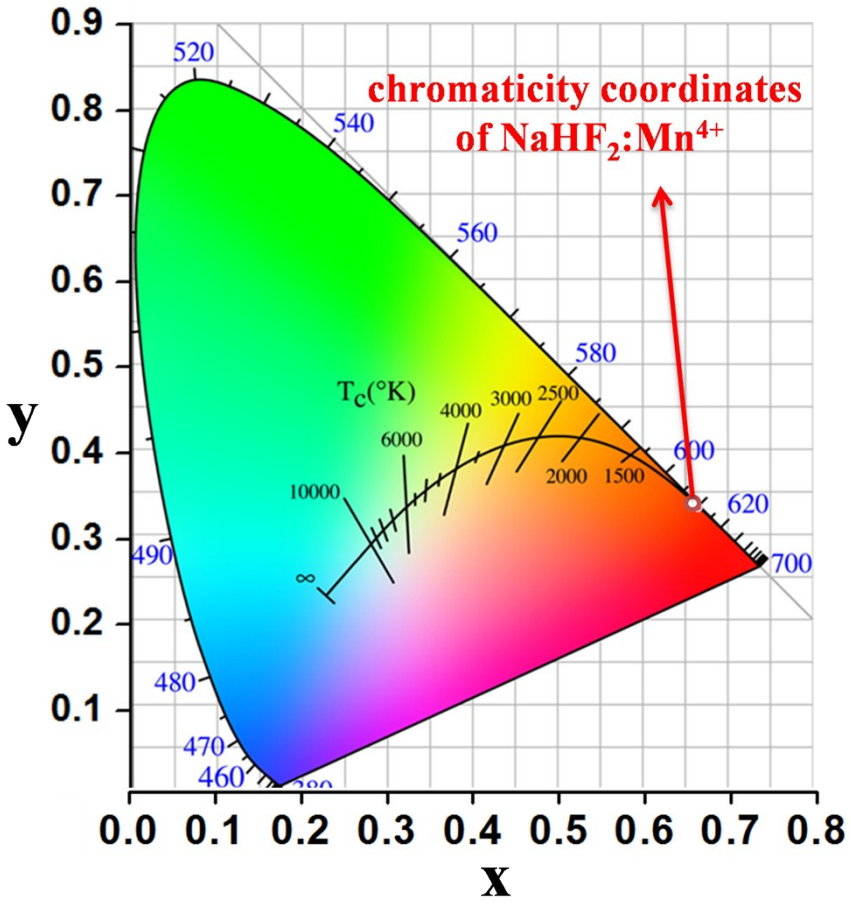

Figure S4. CIE chromaticity coordinates of the as-obtained red phosphor $NaHF_2:Mn^{4+}$.

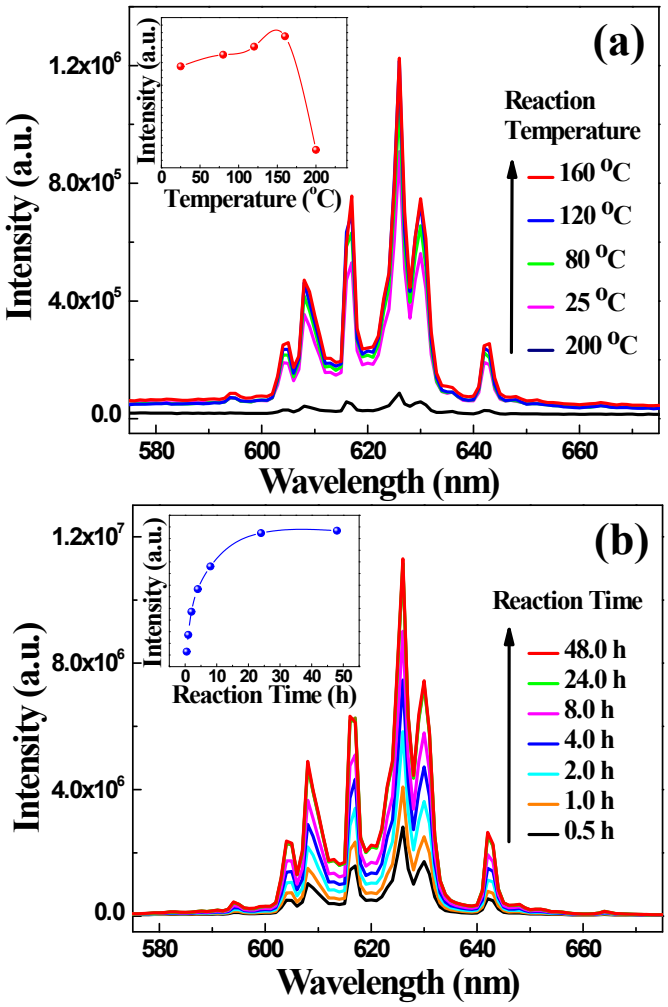

Figure S5. Dependence of emission spectra and integrated luminescence intensity of $NaHF_2:Mn^{4+}$ samples on reaction (a) temperature and (b) time. (All synthetic parameters were kept constant except for the examined variables.)

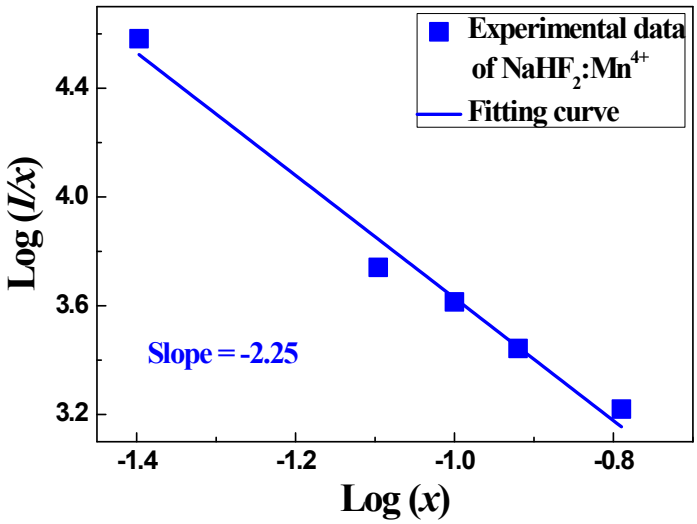

Figure S6. The relationship between log (x) versus log (I/x) in the phosphor $NaHF_2:Mn^{4+}$. (Note: x is the concentration of Mn^{4+}.)