

Supporting Information

Large-scale production of fine-sized $\text{Zn}_2\text{SiO}_4\text{:Mn}$ phosphor microspheres with dense structure and high photoluminescence property by spray-drying process

Jung Sang Cho^a, Su Min Lee^b, Kyeong Youl Jung^c, Yun Chan Kang^{a,}*

^aDepartment of Materials Science and Engineering, Korea University, Anam-dong, Seongbuk-gu, Seoul 136-713, Republic of Korea

E-mail: yckang@korea.ac.kr, Fax: (+82) 2-928-3584

^bDepartment of Chemical Engineering, Konkuk University, 1 Hwayang-dong, Gwangjin-gu, Seoul 143-701, Republic of Korea

^cDepartment of Chemical Engineering, Kongju National University, 275 Buda-dong, Cheonan, Chungnam 330-717, Republic of Korea

Keywords: luminescence, phosphor, gas-phase reaction, ceramics, spray drying

This file includes:

- Particle size distributions of the post-treated $\text{Zn}_2\text{SiO}_4\text{:Mn}$ phosphor powders obtained from the solutions (a) without organic additive, (b) with CA, and (c) with dextrin.
- N_2 adsorption-desorption isotherms measured at 77 K for the post-treated $\text{Zn}_2\text{SiO}_4\text{:Mn}$ powders prepared from the spray solutions without organic additive, and with CA, sucrose, and dextrin.
- XRD patterns of the post-treated $\text{Zn}_2\text{SiO}_4\text{:Mn}$ powders prepared from the solutions with different concentration of dextrin.
- Formation mechanism of solid, hollow, and nano-sized $\text{Zn}_2\text{SiO}_4\text{:Mn}$ powders prepared from the solutions with different concentration of dextrin.
- Schematic diagram and digital photo of spray dryer applied in the preparation of precursor powders.

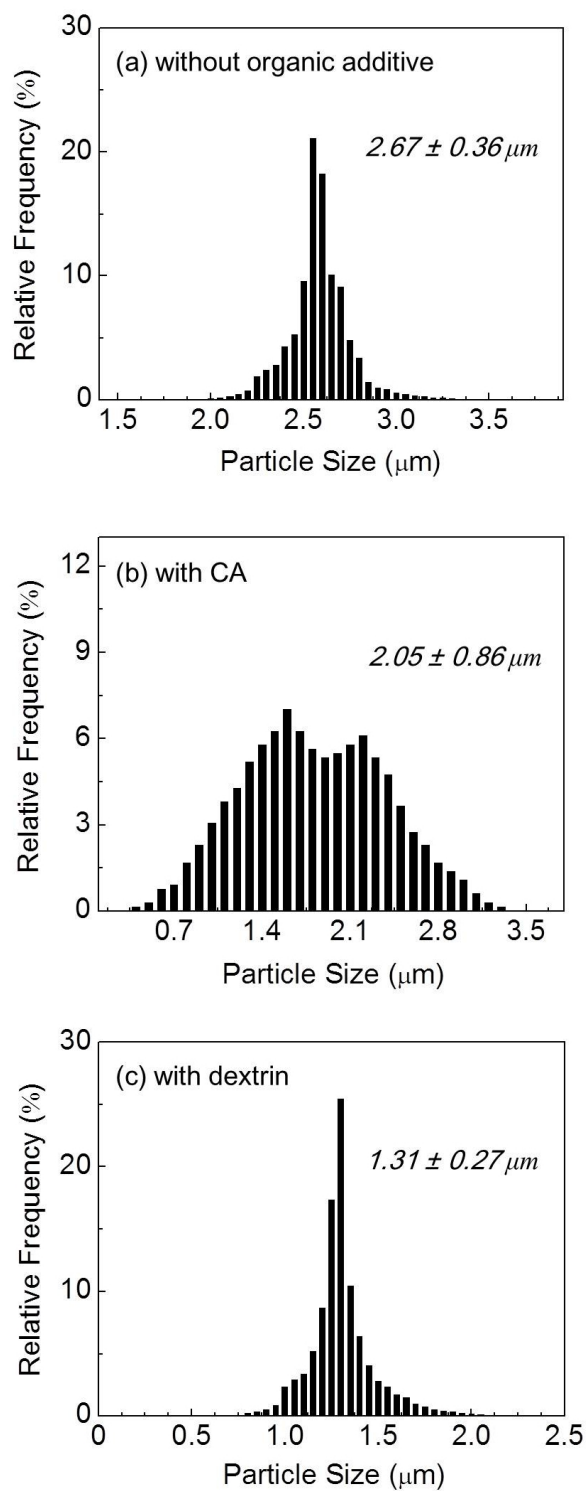


Figure S1. Particle size distributions of the post-treated $\text{Zn}_2\text{SiO}_4:\text{Mn}$ phosphor powders obtained from the spray solutions (a) without organic additive, (b) with CA, and (c) with dextrin.

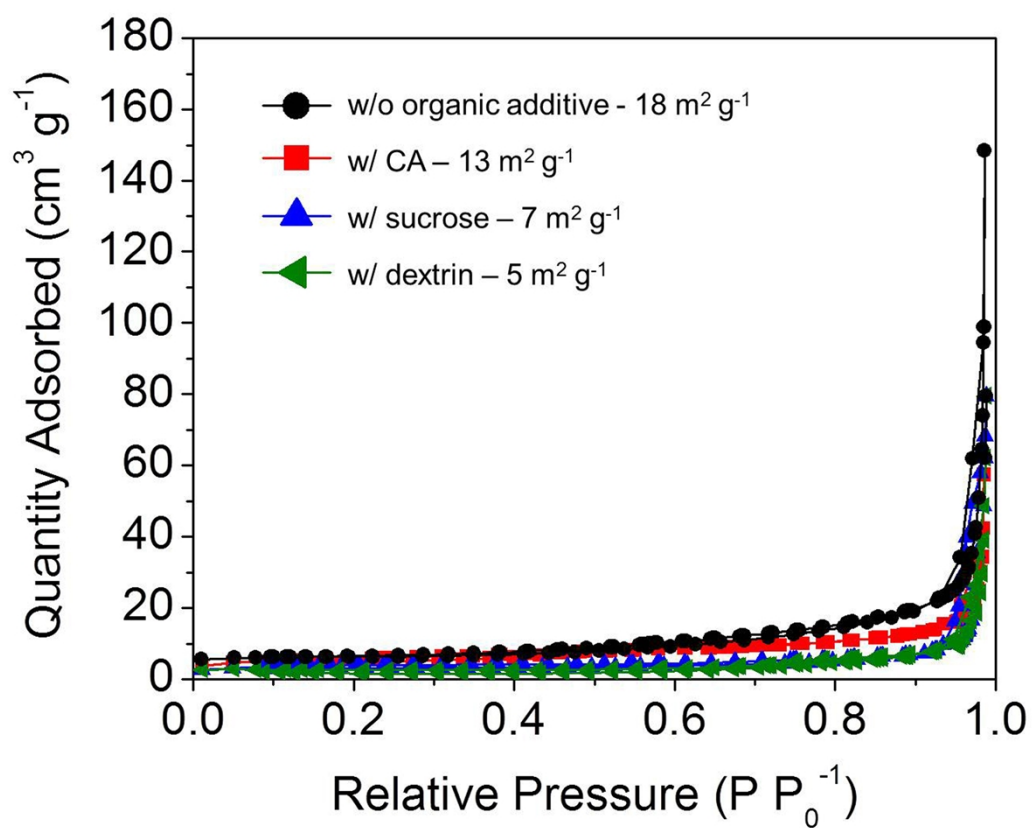


Figure S2. N₂ adsorption-desorption isotherms measured at 77 K for the post-treated Zn₂SiO₄:Mn powders prepared from the spray solutions without organic additive, and with CA, sucrose, and dextrin.

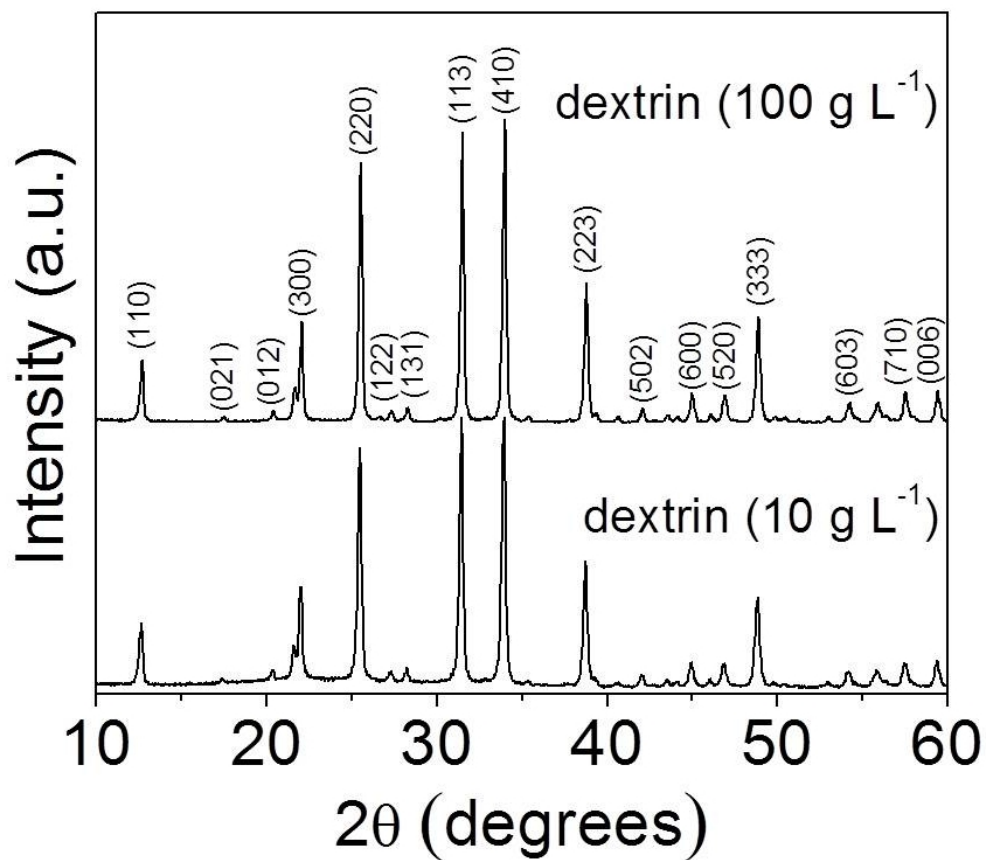
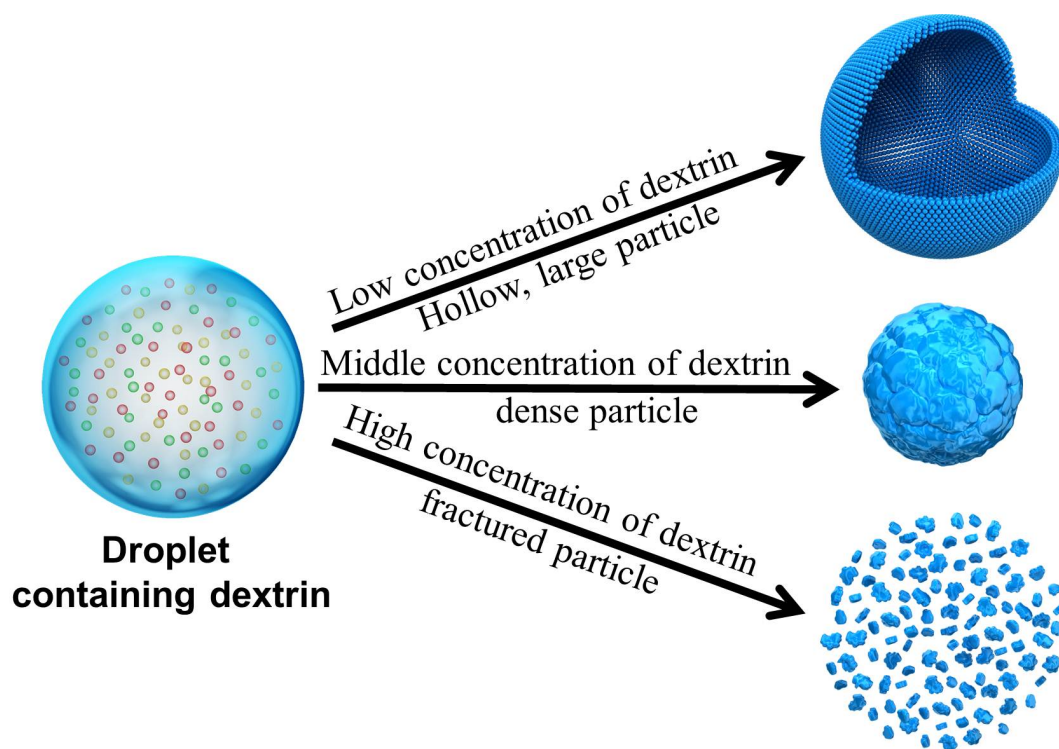


Figure S3. XRD patterns of the post-treated $\text{Zn}_2\text{SiO}_4:\text{Mn}$ powders prepared from the solutions with different concentration of dextrin.



Scheme S1. Formation mechanism of solid, hollow, and nano-sized $\text{Zn}_2\text{SiO}_4:\text{Mn}$ powders prepared from the solutions with different concentration of dextrin.

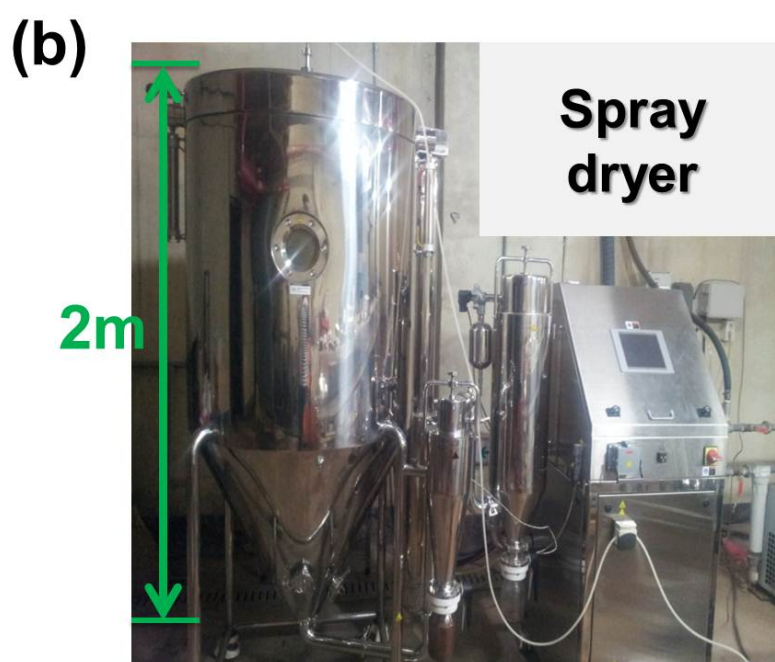
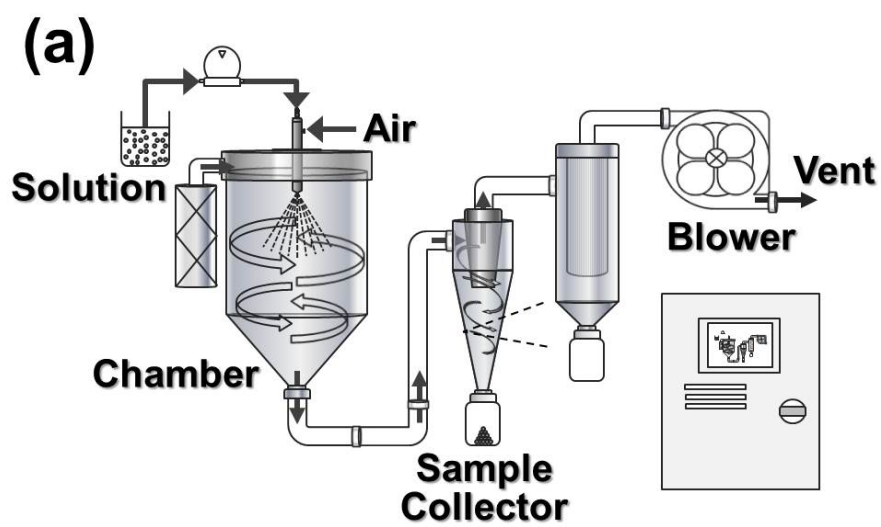


Figure S4. Schematic diagram and digital photo of spray dryer applied in the preparation of precursor powders.