Supporting information for

Emissions and photocatalytic selectivity of SrWO<sub>4</sub>:  $Ln^{3+}$  (Eu<sup>3+</sup>, Tb<sup>3+</sup>, Sm<sup>3+</sup> and Dy<sup>3+</sup>) prepared by supersonic microwave co-assistance method (SMC)

Yuhui Zheng <sup>b</sup>, Jintai Lin <sup>b</sup>, Qianming Wang <sup>\*a,b</sup>

<sup>a</sup> Key Laboratory of Theoretical Chemistry of Environment, Ministry of Education,

School of Chemistry and Environment, South China Normal University, Guangzhou 510006,

P. R. China

<sup>b</sup> School of Chemistry and Environment, South China Normal University, Guangzhou 510006,

P. R. China

• To whom the correspondence should be addressed. E-mail: <u>qmwang@scnu.edu.cn</u>

Tel: 86-20-39310187; Fax: 86-20-39310187



Supersonic assisted microwave reactor image in our lab.



Figure S1 Infrared spectrum of SrWO<sub>4</sub>: Eu<sup>3+</sup>.



Figure S2 Excitation spectrum of SrWO<sub>4</sub>: Tb<sup>3+</sup> by SMC method.



Figure S3 Excitation spectrum of SrWO<sub>4</sub>: Sm<sup>3+</sup> by SMC method.



Figure S4 Excitation spectrum of SrWO<sub>4</sub>: Dy<sup>3+</sup> by SMC method.



Figure S4 Excitation spectrum of SrWO<sub>4</sub>:  $Eu^{3+}$  by SMC method (\* indicates artifacts of scattering).



Figure S5 Photocatalytic activities of  $SrWO_4$ :  $Eu^{3+}$  for methylene blue. Inset: photocatalytic activities of  $SrWO_4$ :  $Eu^{3+}$  for methyl orange or rhodamine b (irradiation by a 500 W mercury lamp for 70 minutes).



Figure S6 Photocatalytic behavior (SrWO<sub>4</sub>:  $Eu^{3+}$ ) for methyl orange by co-precipitation, hydrothermal, sintering or reverse micelle (irradiation by a 500 W mercury lamp for 70 minutes).



Figure S7 Photocatalytic behavior (SrWO<sub>4</sub>:  $Eu^{3+}$ ) for rhodamine b by co-precipitation, hydrothermal, sintering or reverse micelle (irradiation by a 500 W mercury lamp for 70 minutes).