

## Supporting Information

# Multi-wavelength tailoring of ZnGa<sub>2</sub>O<sub>4</sub> nanosheet phosphor via defect engineering

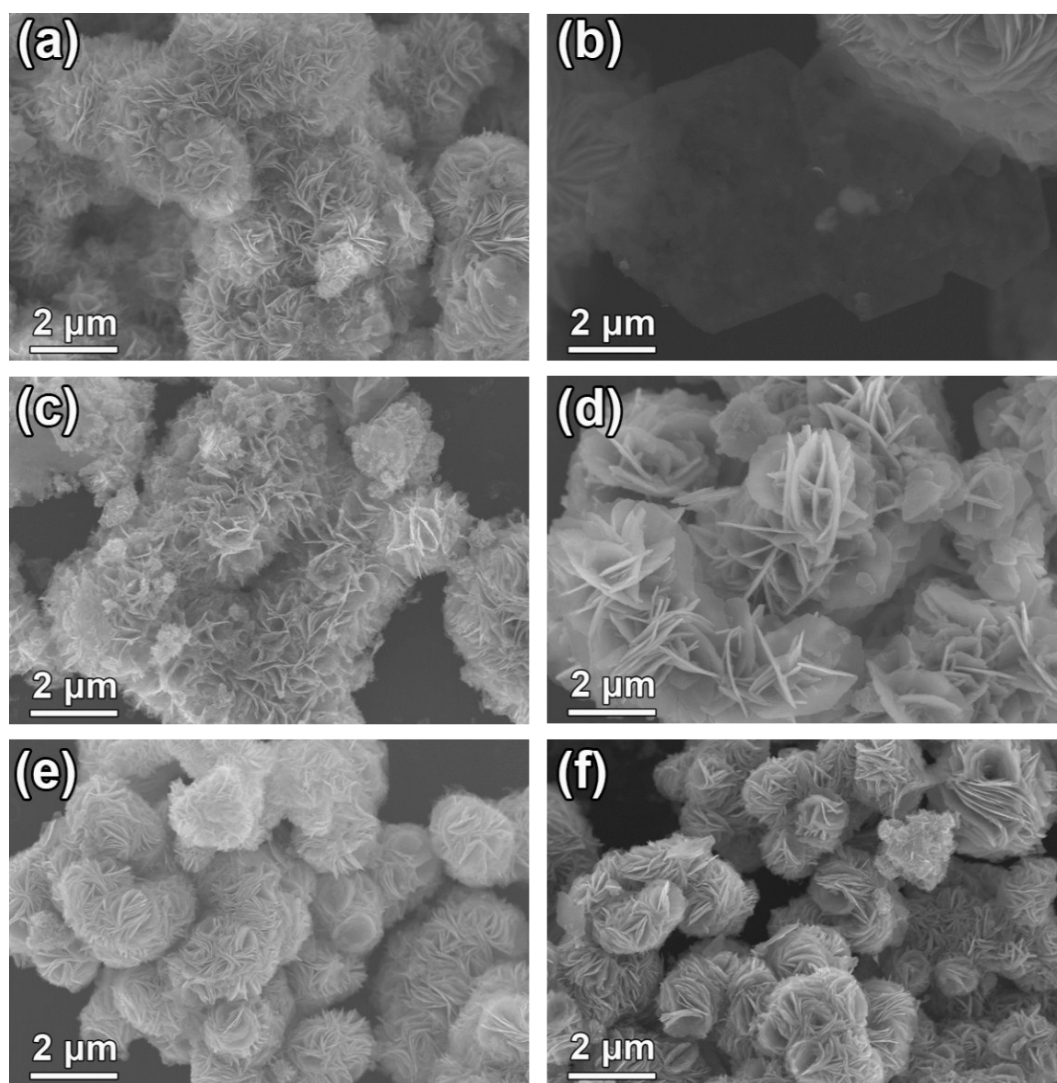
Wenjin Yang,<sup>‡ab</sup> Jing Li,<sup>†a</sup> Baodan Liu\*<sup>a</sup> Xinglai Zhang,<sup>a</sup> Cai Zhang,<sup>ab</sup> Pingjuan Niu\*<sup>c</sup> and  
Xin Jiang\*<sup>a</sup>

<sup>a</sup> Shenyang National Laboratory for Materials Science (SYNL), Institute of Metal  
Research (IMR), Chinese Academy of Sciences (CAS), No. 72 Wenhua Road, Shenyang  
110016 China

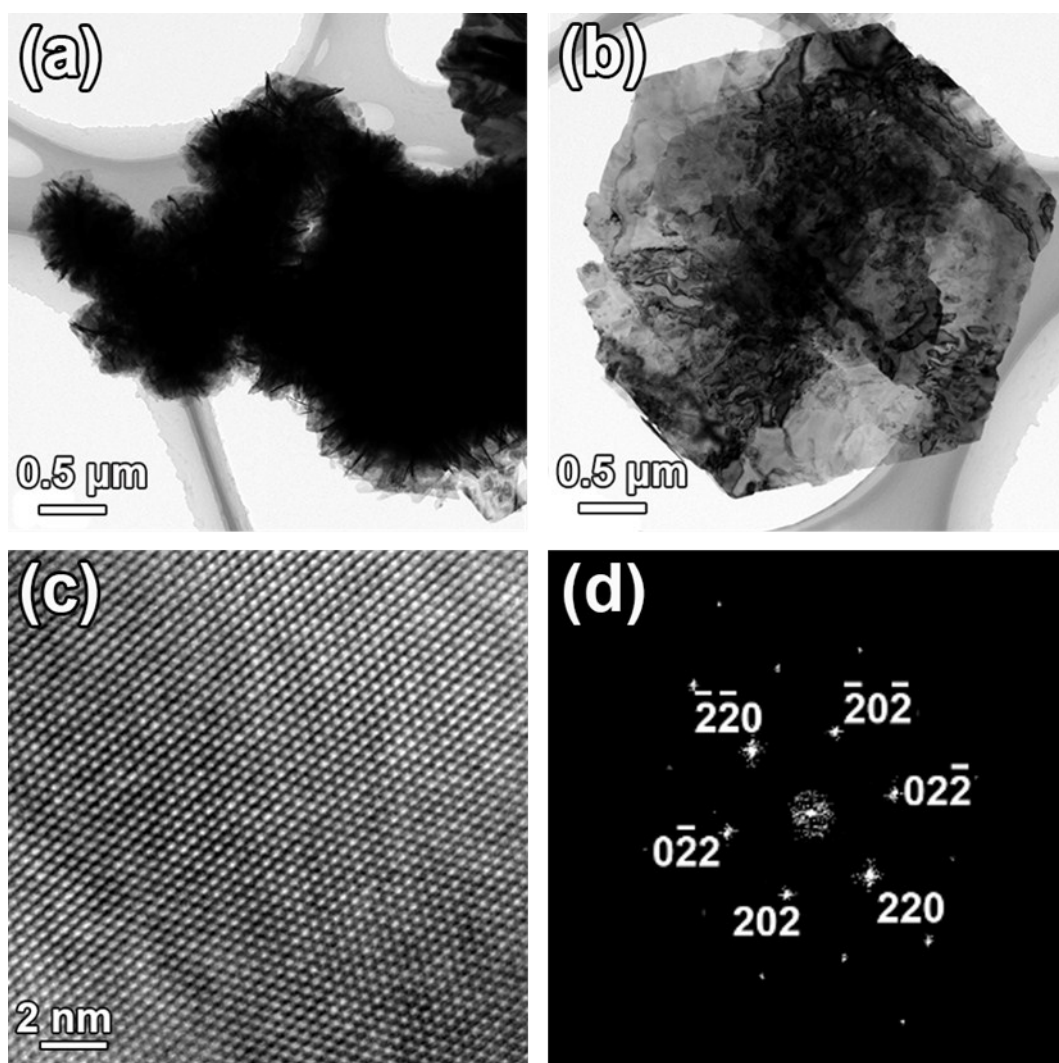
<sup>b</sup> School of Materials Science and Engineering, University of Science and Technology  
of China, No. 72 Wenhua Road, Shenyang 110016 China

<sup>c</sup> School of Electrical Engineering and Automation, Tianjin Polytechnical University No.  
399, Binshuixi Road, Tianjin 300387, China

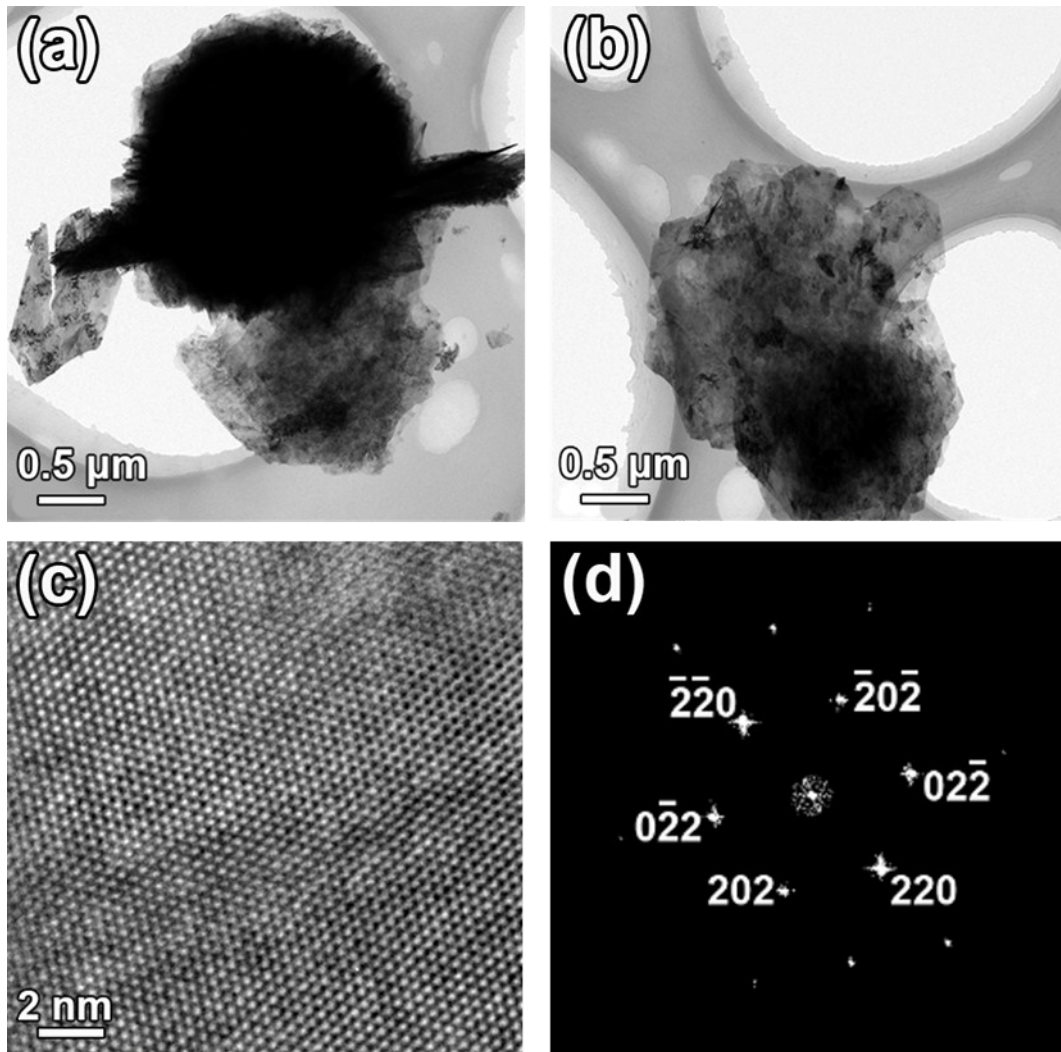
contact: [baodanliu@hotmail.com](mailto:baodanliu@hotmail.com)



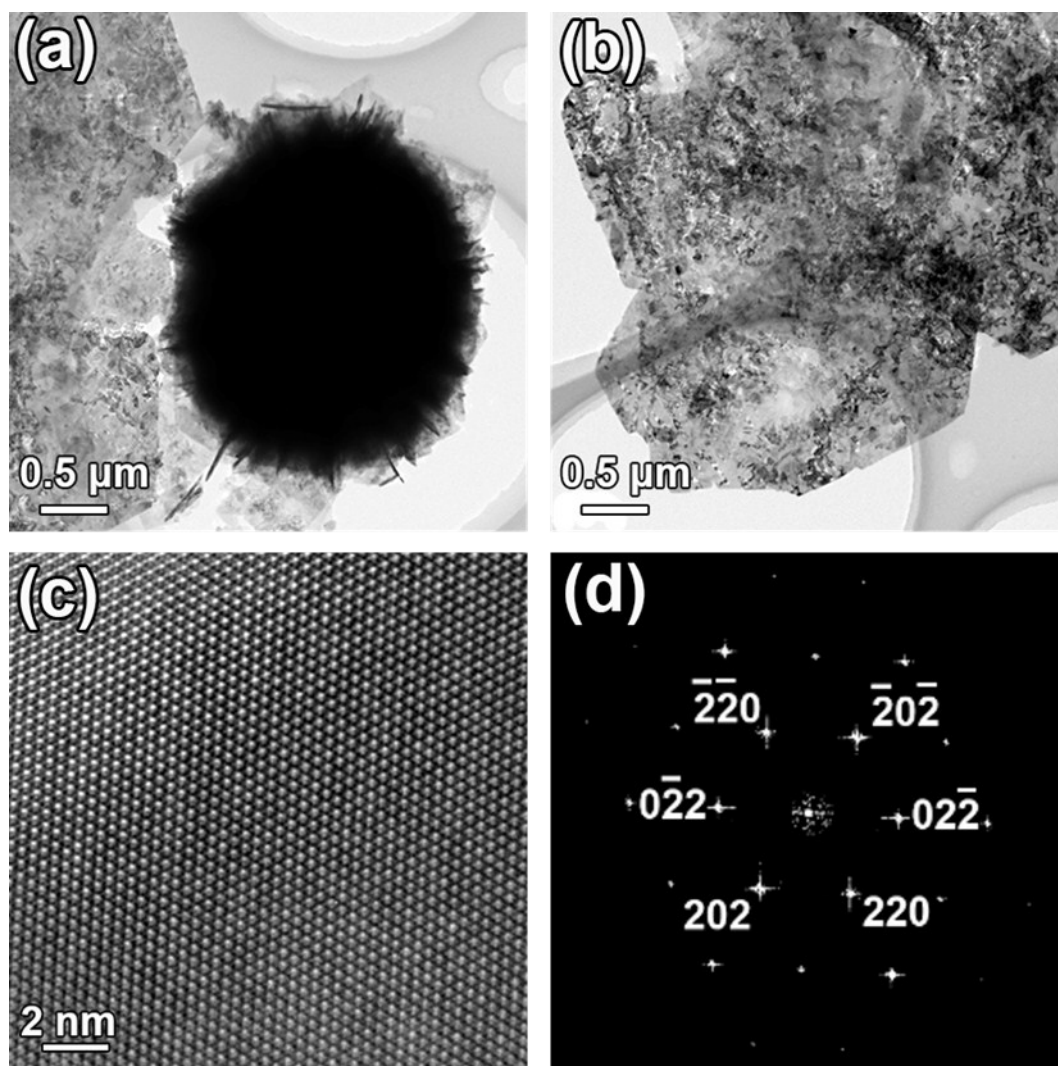
**Fig. S1** SEM images of (a, b) as-synthesized ZnGa<sub>2</sub>O<sub>4</sub> nanosheets and annealed samples at (c) 400 °C, (d) 600 °C, (e) 800 °C and (f) 1000 °C, respectively;



**Fig. S2** (a, b) TEM images, (c) HRTEM image and (d) corresponding FFT image of annealed  $\text{ZnGa}_2\text{O}_4$  nanosheets at 400 °C for 2 h;

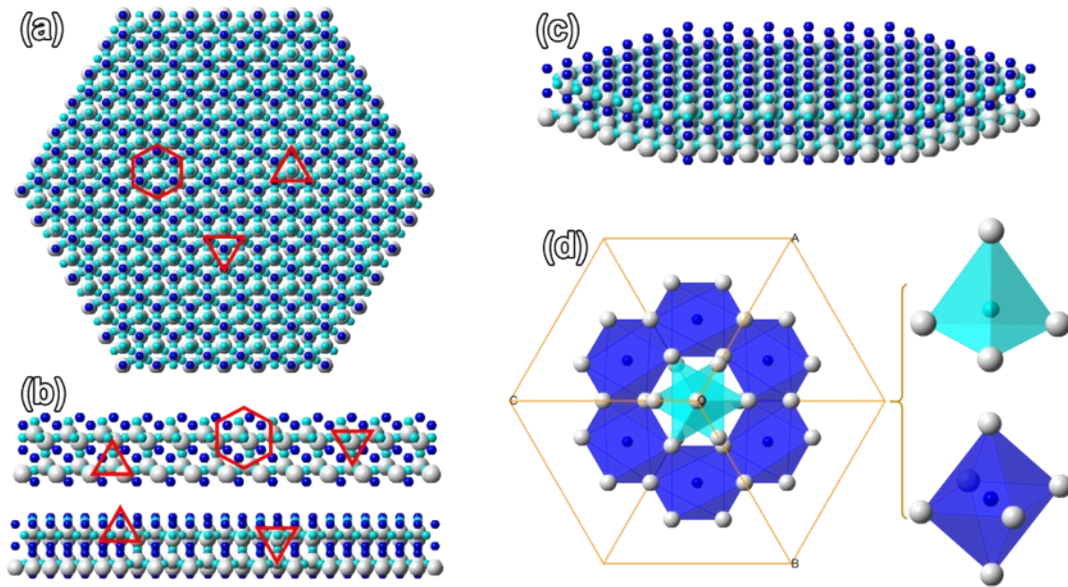


**Fig. S3** (a, b) TEM images, (c) HRTEM image and (d) corresponding FFT image of annealed ZnGa<sub>2</sub>O<sub>4</sub> nanosheets at 600 °C for 2 h;

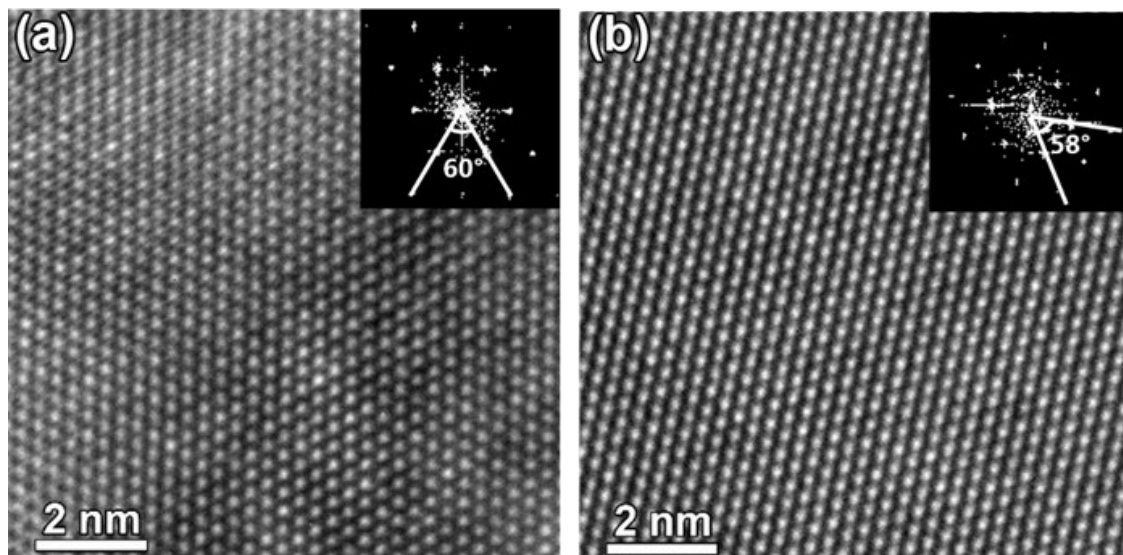


**Fig. S4** (a, b) TEM images, (c) HRTEM image and (d) corresponding FFT image of annealed  $\text{ZnGa}_2\text{O}_4$  nanosheets at 800 °C for 2 h;

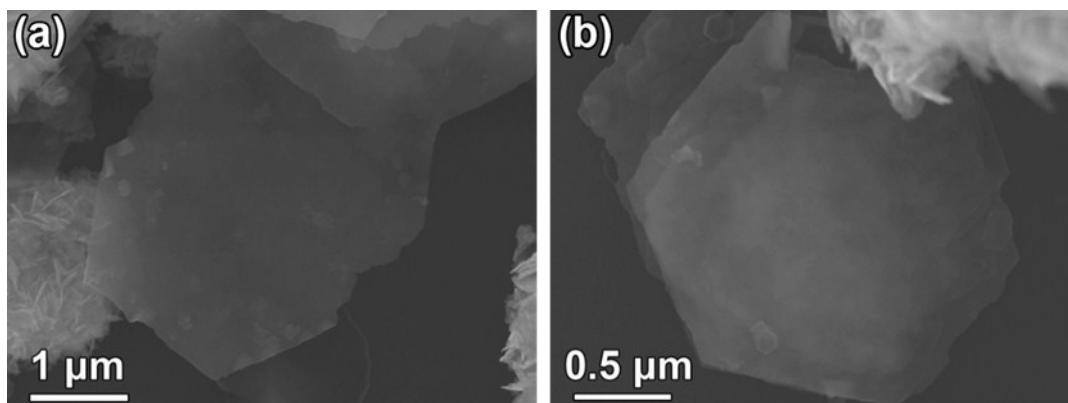




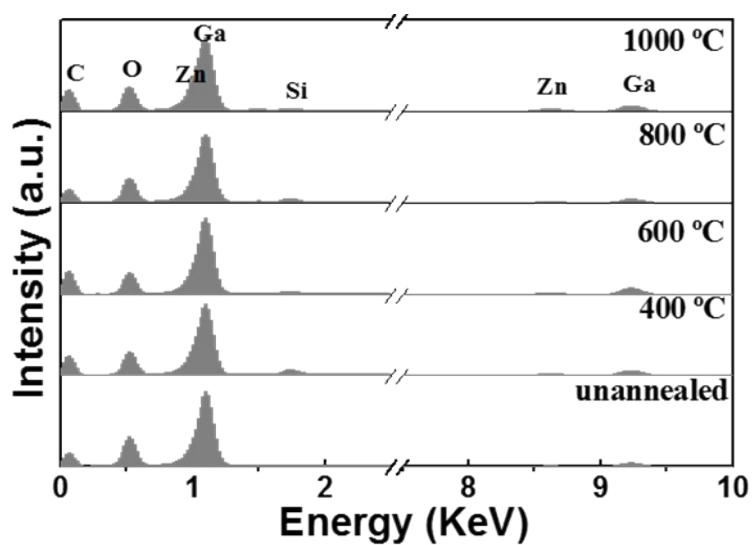
**Fig. S5** (a) top-view, (b) side-view and (c) an inclination of 75° view of the schematic diagram of atomic stacking for (111)  $\text{ZnGa}_2\text{O}_4$  nanosheets; (d) schematic diagram of polyhedral  $\text{ZnGa}_2\text{O}_4$ ,  $[\text{ZnO}_4]$  tetrahedron and  $[\text{GaO}_6]$  octahedron;



**Fig. S6** (a) HRTEM image of (a) as-synthesized and (b) annealed  $\text{ZnGa}_2\text{O}_4$  nanosheets at 1000 °C for 2 h; inset is corresponding FFT image;



**Fig. S7** Typical SEM images of (a) as-synthesized and (b) annealed hexagonal ZnGa<sub>2</sub>O<sub>4</sub> nanosheets at 1000 °C for 2 h;



**Fig. S8** EDS spectra of as-synthesized ZnGa<sub>2</sub>O<sub>4</sub> nanosheets and annealed samples at 400 °C, 600 °C, 800 °C and 1000 °C for 2 h, respectively;