

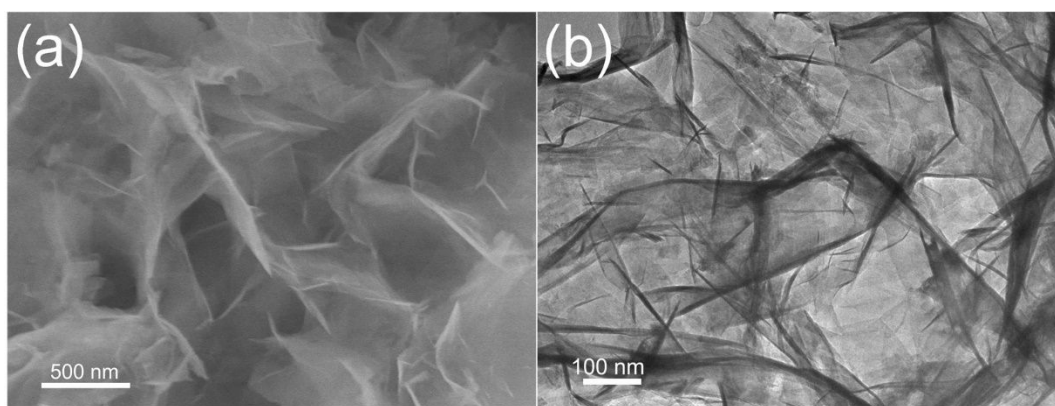
# Phase transition of 2D $\beta$ -Ga<sub>2</sub>O<sub>3</sub> Nanosheets from Ultrathin $\gamma$ -Ga<sub>2</sub>O<sub>3</sub> Nanosheets and Their Photocatalytic Hydrogen Evolution Activities

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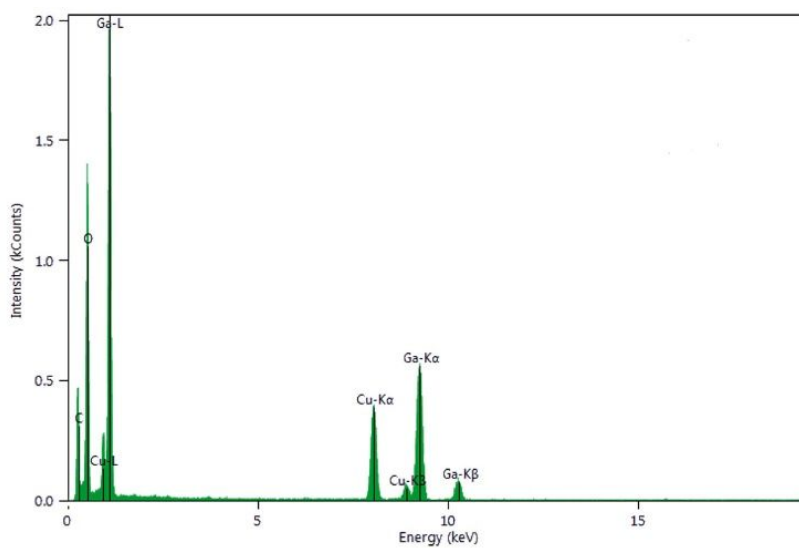
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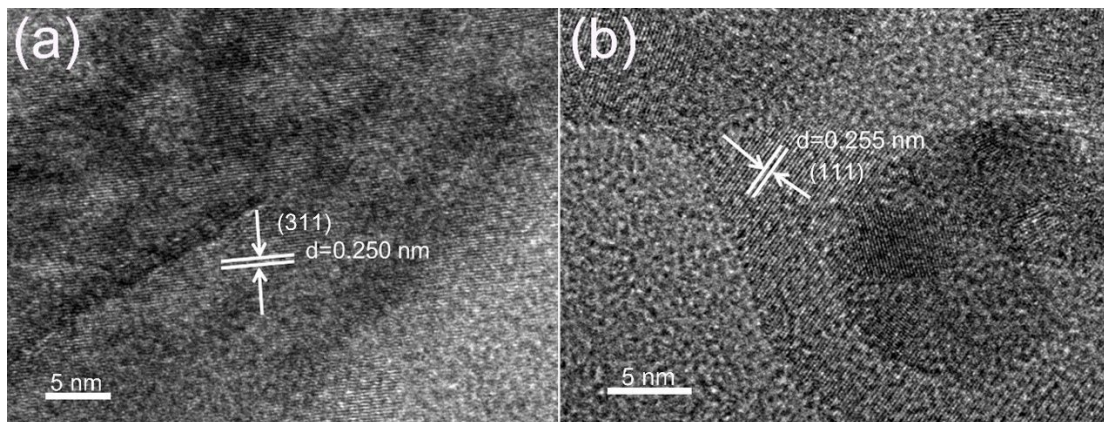
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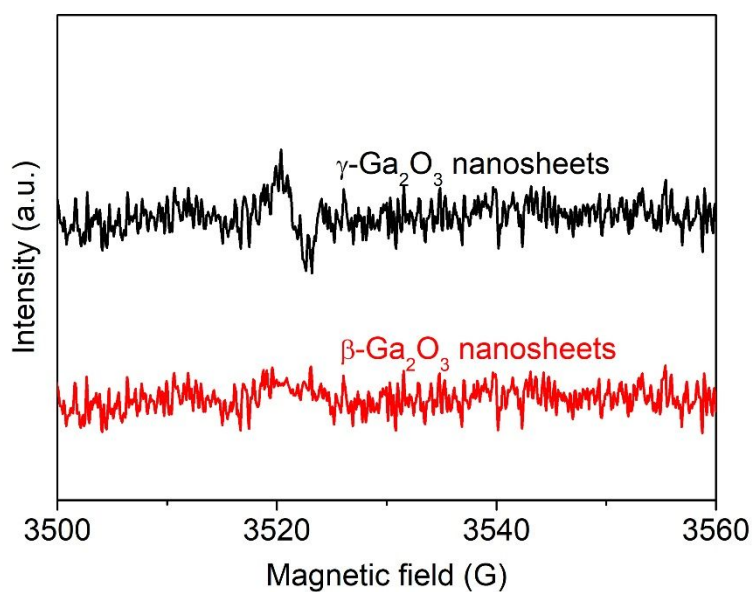
**Figure S1.** (a) SEM, (b) TEM images of  $\gamma$ -Ga<sub>2</sub>O<sub>3</sub> nanosheets.



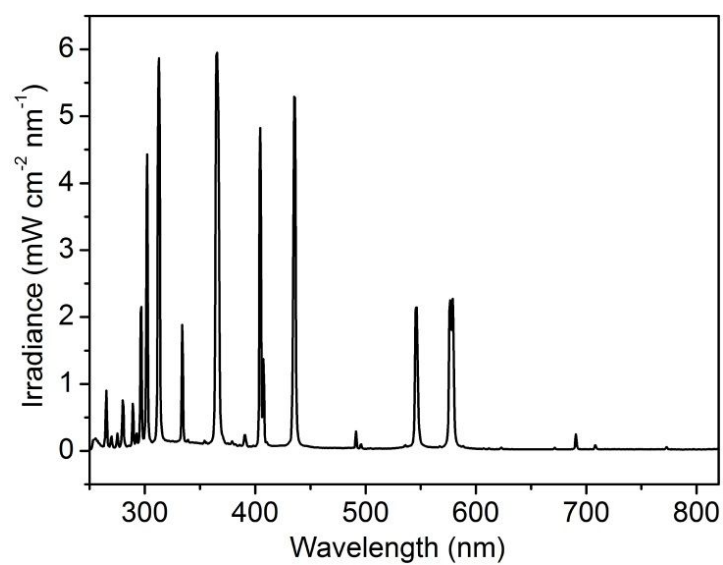
**Figure S2.** EDX spectroscopy of  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> nanosheets.



**Figure S3.** HRTEM images of  $\gamma$ -Ga<sub>2</sub>O<sub>3</sub> (a) and  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> nanosheets (b).



**Figure S4.** The electron spin resonance spectra of  $\gamma\text{-Ga}_2\text{O}_3$  and  $\beta\text{-Ga}_2\text{O}_3$  nanosheets.



**Figure S5.** The irradiance spectrum of the high-voltage mercury lamp with 125 W.