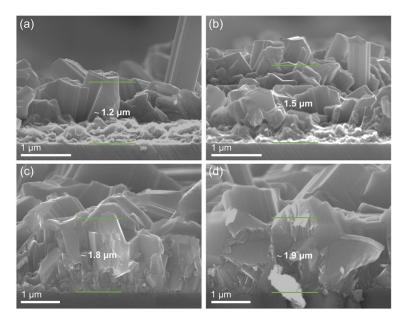
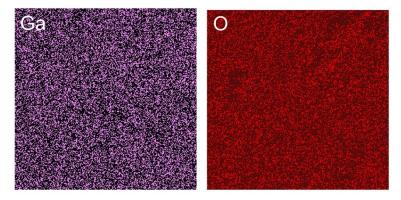
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## [Supporting Information]



**Figure S1.** Cross-sectional SEM images of Ga<sub>2</sub>O<sub>3</sub> films prepared at different heating rates during thermal oxidation. (a) 20 °C/min, (b) 10 °C/min, (c) 5 °C/min, and (d) 2 °C/min.



**Figure S2.** SEM-EDX mapping of  $Ga_2O_3$  film at a scale of 100  $\mu$ m  $\times$  100  $\mu$ m.