

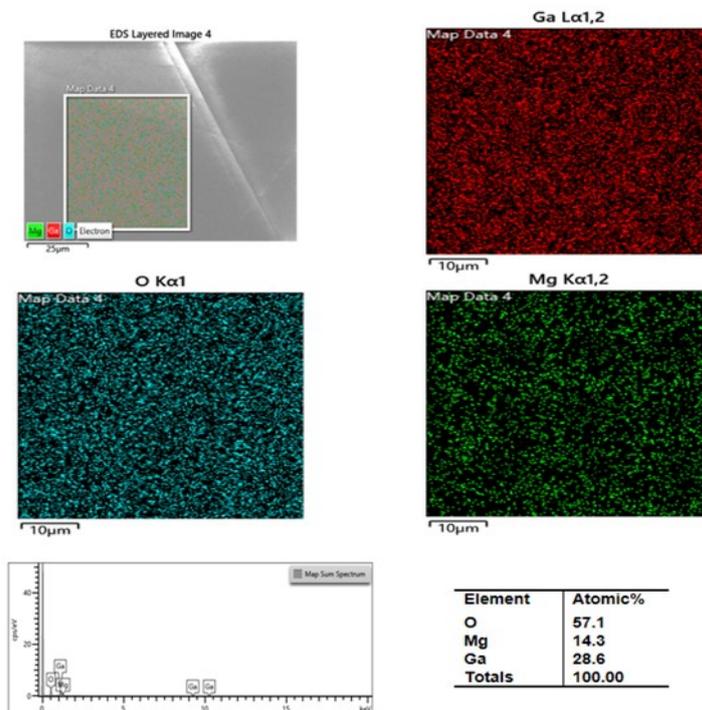
Supporting Information

Growth and Characterization of Ultra-Wide-Bandgap MgGa₂O₄ Single Crystals

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1. Supplementary figures

Figure S1. Energy-dispersive X-ray spectroscopy (EDS) elemental mapping of the VGF-grown MgGa_2O_4 crystal.

Note: To verify the elemental composition of the as-prepared crystal, EDS (Energy Dispersive X-ray Spectroscopy) analysis was performed on the MgGa_2O_4 crystal. The results show that the crystal surface is flat and dense, with linear traces introduced during the processing. Elemental mapping indicates uniform distribution of Ga, O, and Mg without elemental segregation. Quantitative analysis reveals atomic percentages of O, Mg, and Ga as 57.1%, 14.3%, and 28.6%, respectively, which are in excellent agreement with the theoretical stoichiometric ratio of MgGa_2O_4 , with a Ga/Mg atomic ratio of approximately 2. No impurity elements were detected in the EDS full spectrum.

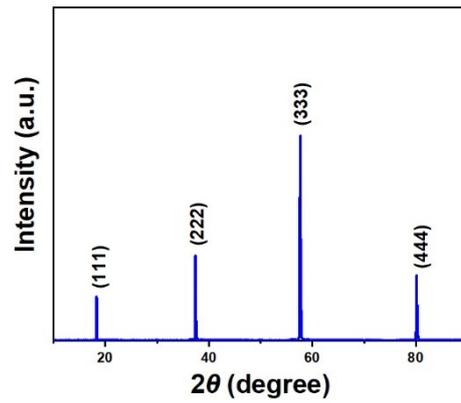


Figure S2. XRD pattern of MgGa_2O_4 (111) crystal plane

Note: XRD testing was performed on the oriented (111) surface, and only four diffraction peaks appeared at $2\theta \approx 18.6^\circ$, 37.7° , 58.0° , and 80.3° , corresponding to the (111), (222), (333), and (444) crystal planes of the spinel structure, respectively. This result indicates that the crystal possesses a single orientation.

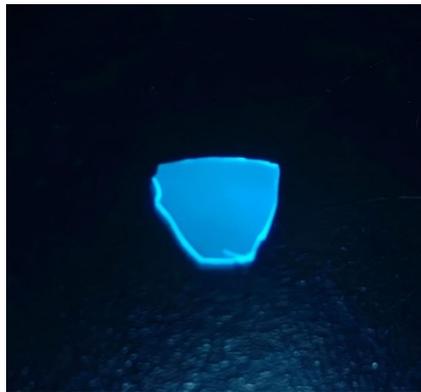


Figure S3. Photograph of MgGa_2O_4 crystal under UV excitation.