

The Effect of a Nucleation Layer on Morphology and Grain Size in MOCVD-Grown β -Ga₂O₃ Thin Films on C-Plane Sapphire

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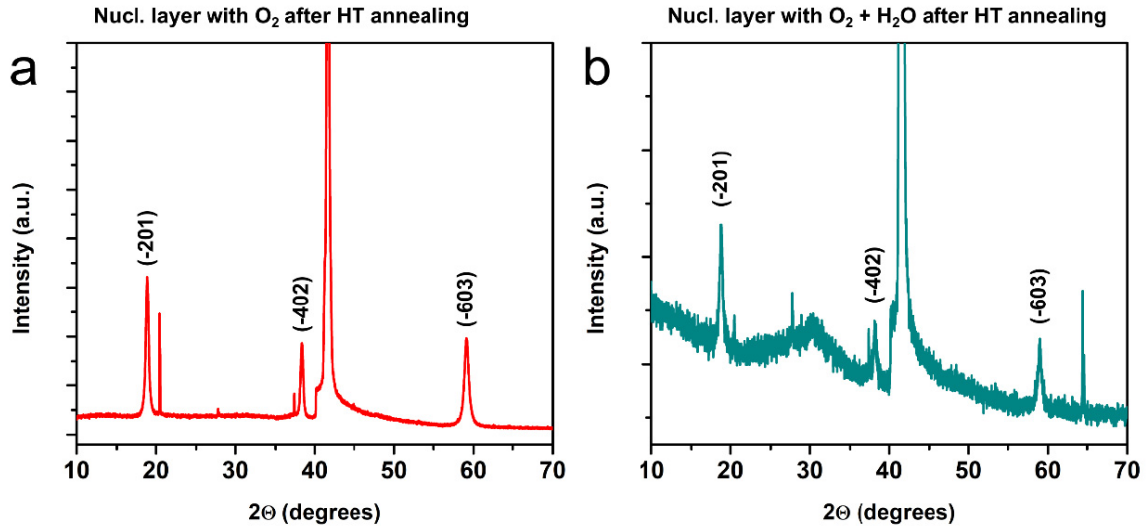


Figure S1. X-ray diffraction patterns of the nucleation layers after annealing at 1030 °C for 150 s. The layers were prepared with (a) O₂ and (b) O₂ + H₂O as the oxygen precursors. The low-temperature layers deposited at 720 °C before the annealing are X-ray amorphous. The unmarked peaks belong to the c-plane sapphire substrate.

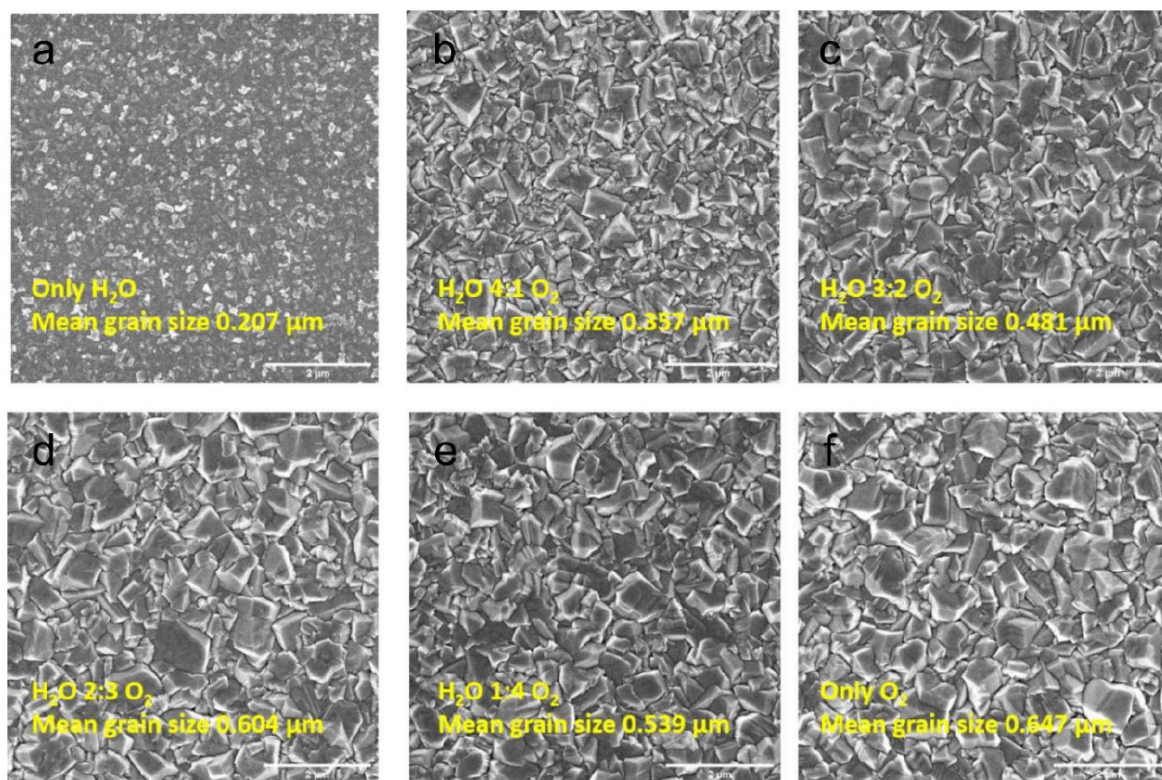


Figure S2. Scanning electron microscope images of MOCVD-grown Ga₂O₃ thin films using H₂O vapour and O₂ gas as oxygen precursors at various ratios. Total oxygen precursor flow was kept constant at 500 sccm. Higher O₂ proportion leads to larger grain sizes. Scale bars correspond to 2 μm.

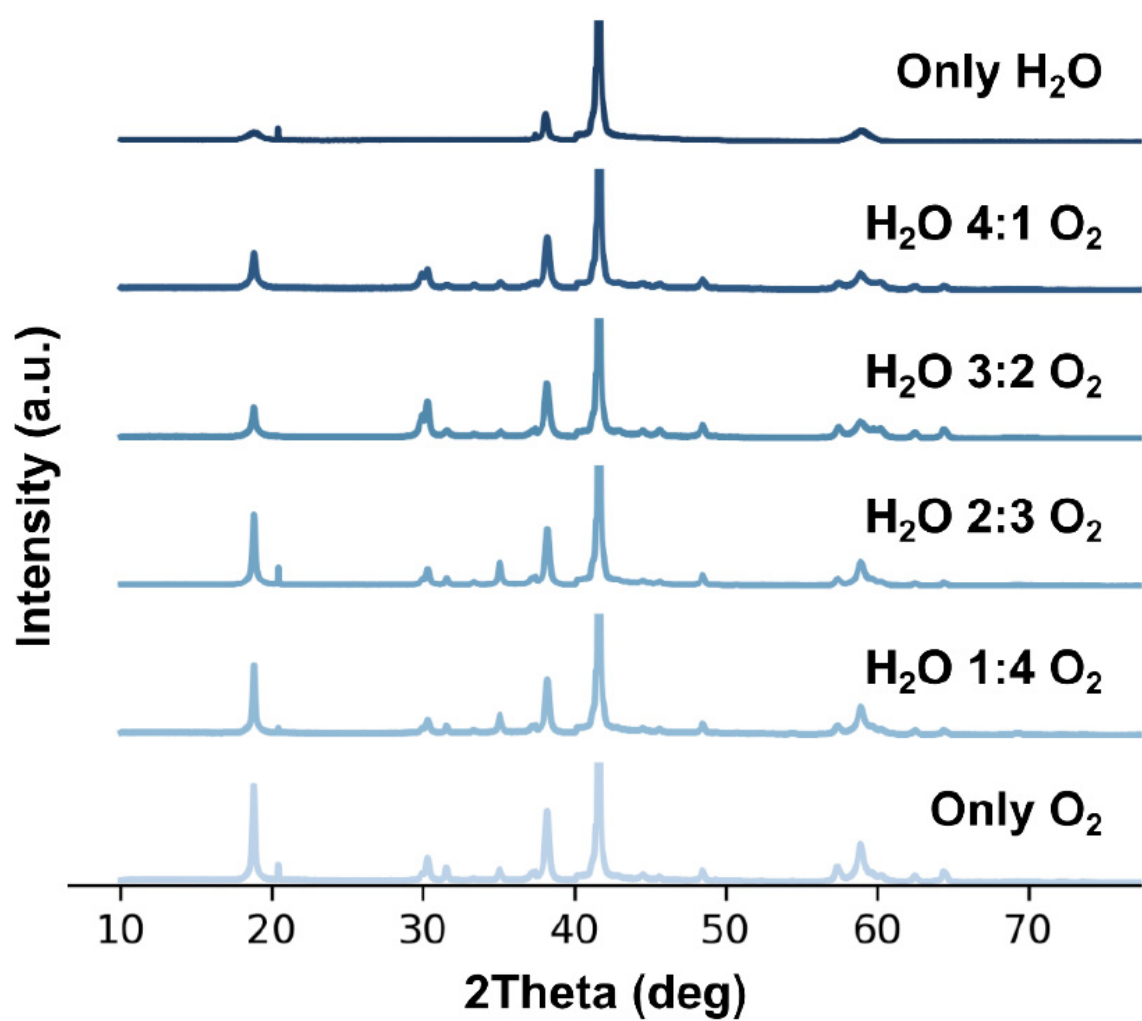


Figure S3. X-ray diffraction patterns of MOCVD-grown Ga₂O₃ thin films using H₂O vapour and O₂ gas as oxygen precursors at various ratios. Total oxygen precursor flow was kept constant at 500 sccm.

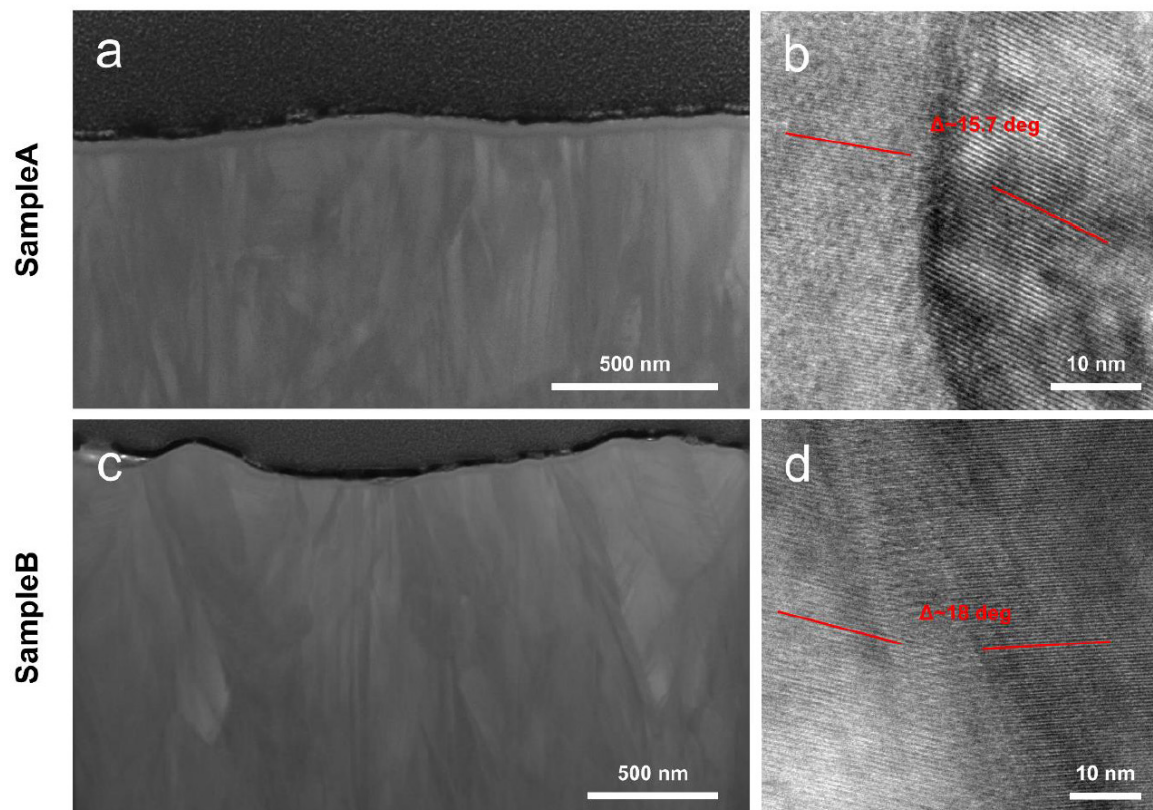


Figure S4. Scanning electron images of cross-section cuts of (a) SampleA and (c) SampleB. Transmission electron microscope images of the studied grain boundaries in (b) SampleA and (d) SampleB. Typically, most boundaries found in the samples are low-angle grain boundaries with misalignment of 1-3°, however, regions of grain misalignment up to 18° could be occasionally identified.