

Structural characterization of $\text{Gd}_2\text{Mo}_3\text{O}_{12}$ thin films grown onto YSZ(001) and YSZ buffered Si(001) substrates

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$\text{Gd}_2\text{Mo}_3\text{O}_{12}$ (GMO) is a metallic oxide that can be obtained in different crystalline phases (orthorhombic, monoclinic and tetragonal) in bulk samples. In its orthorhombic structure, GMO shows ferroelastic and ferroelectric behaviors, which make it to be interesting for technological applications. In this study, we have deposited GMO thin films onto YSZ buffered silicon substrates and onto STO single-crystals, and we have characterized the crystal structure of the films by means of the reciprocal space maps, obtained with a four-axis diffractometer. Films showed good crystallinity, with out-of-plane and in-plane alignments. The crystal structure of GMO films is very similar to the monoclinic bulk GMO one, but slightly strained to epitaxially fit the substrate net. The epitaxial relationship with the Si is $(080)\text{GMO} // (004)\text{Si}; [100]\text{GMO} // [110]\text{Si}$. Films grown onto STO also show good crystallinity, being the epitaxial relationship: $(080)\text{GMO} // (002)\text{STO}; [100]\text{GMO} // [100]\text{STO}$.

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