

Optical Properties of Yttrium Ferrite Films Prepared by Pulse Laser Deposition

Dinara Sobola ^{1,*}, Hekmat F. Saleh ², Pavla Kočková ², Richard Shubert ², Rashid Dallaev ² and Tomáš Trčka ²

¹ Institute of Physics of Materials, Czech Academy of Sciences, Žitkova 22, 61662 Brno, Czech Republic

² Department of Physics, Faculty of Electrical Engineering and Communication, Brno University of Technology, Technická 2848/8, 61600 Brno, Czech Republic; saleh.hekmat@ceitec.vutbr.cz (H.F.S.); xsneubauerovap@vut.cz (P.K.); xschub01@vut.cz (R.S.); xdalla03@vut.cz (R.D.); trcka@vut.cz (T.T.)

* Correspondence: sobola@ipm.cz

Nanocrystalline materials tend to scatter X-rays less efficiently than bulk materials, leading to lower intensities and a reduced signal-to-noise ratio. This can obscure smaller or less intense peaks, limiting the detection of specific phases or minor components. Nanocrystals often produce diffraction patterns with a high amorphous-like background due to surface atoms and disorder. This can make it difficult to separate crystalline diffraction peaks from the background noise and hampers precise phase analysis. Nanocrystalline materials with subtle structural differences become indistinguishable in XRD because the peak broadening reduces the resolution between closely spaced peaks (Figure S1).

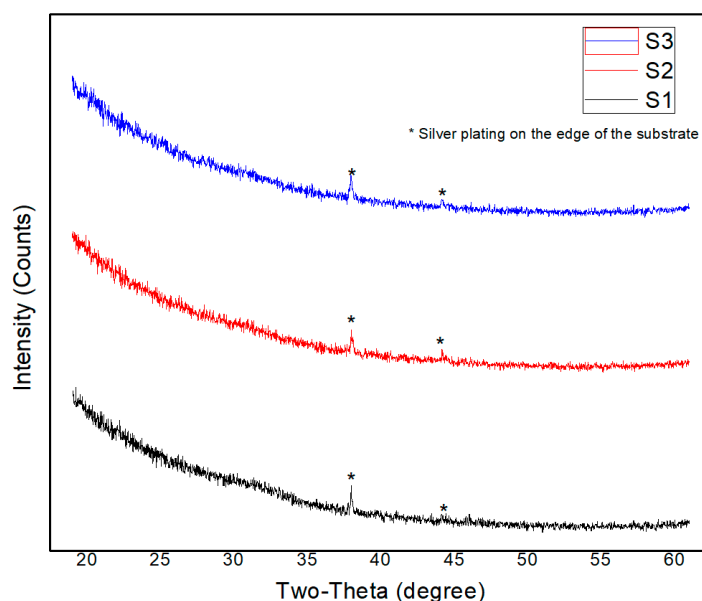


Figure S1. XRD patterns of the YFO films.

The peak around 38° can correspond to the (202) or (310) plane of YFeO_3 . It is not always intense but can appear in well-crystallized orthorhombic structures. The peak around 44° is often attributed to the (220) plane of YFeO_3 . Peaks in this region are typically less intense but can indicate the crystallinity and orientation of YFeO_3 .