

Supporting Information

On stoichiometry and intermixing at the spinel/perovskite interface in CoFe₂O₄/BaTiO₃ thin films

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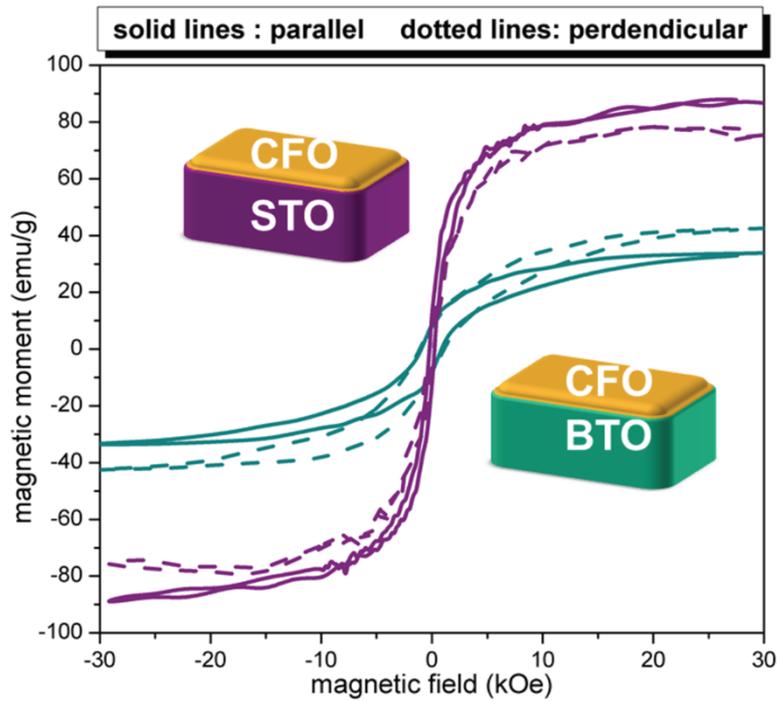


Figure S1: Magnetic moment measured perpendicular (dotted lines) and parallel (solid lines) to the CoFe₂O₄ film on BaTiO₃. Corresponding curves recorded from a CoFe₂O₄ film on a SrTiO₃ substrate are shown for comparison. The CoFe₂O₄/BaTiO₃ system exhibits an overall reduction in magnetic susceptibility, a reduction in total magnetic moment and an increase in magnetic coercivity compared to CoFe₂O₄/SrTiO₃. A comparison with results obtained for other substrates can be found in Ref. [1]

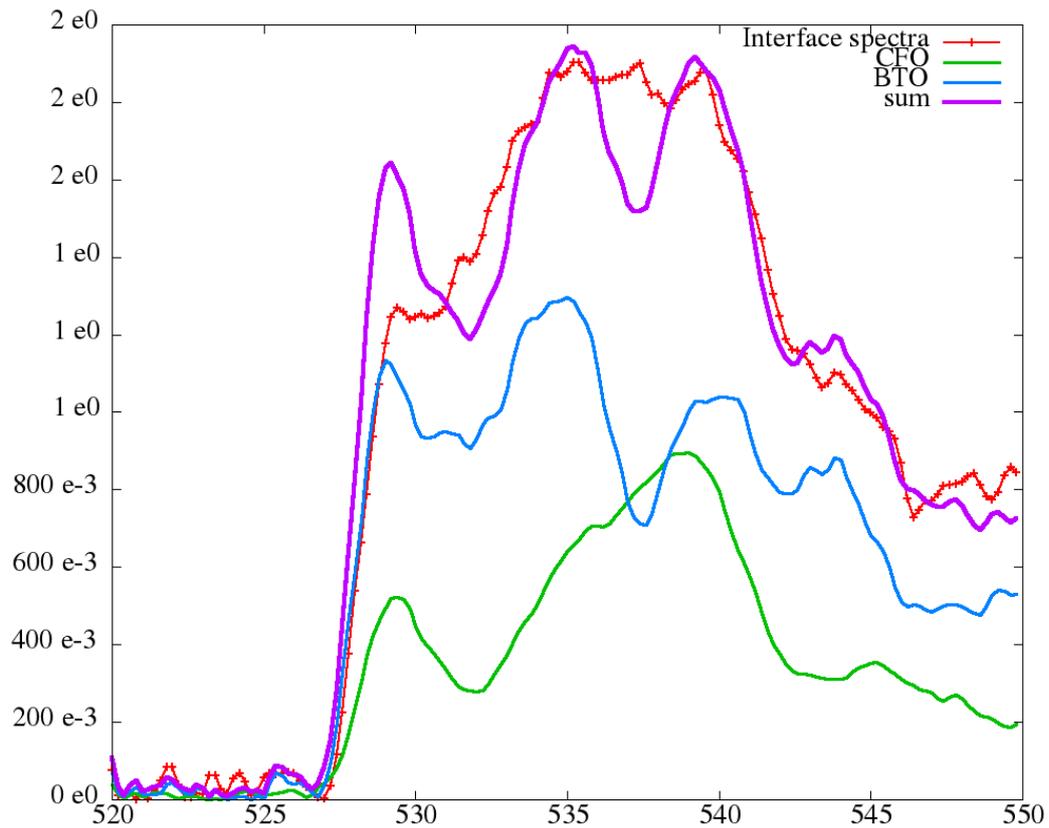


Figure S2: Multiple linear least-squares (MLLS) analysis of the oxygen K edge using BaTiO_3 (BTO) (blue line) and CoFe_2O_4 (CFO) (green line) spectra, which were acquired from regions away from the interface, in order to determine the chemical nature of the interface layer. The sum of the two standards (magenta line) is a poor match to the interface spectra (red line), suggesting that the interface has a different chemical composition from CFO, BTO or a combination of the two and that a new phase has formed at the interface.

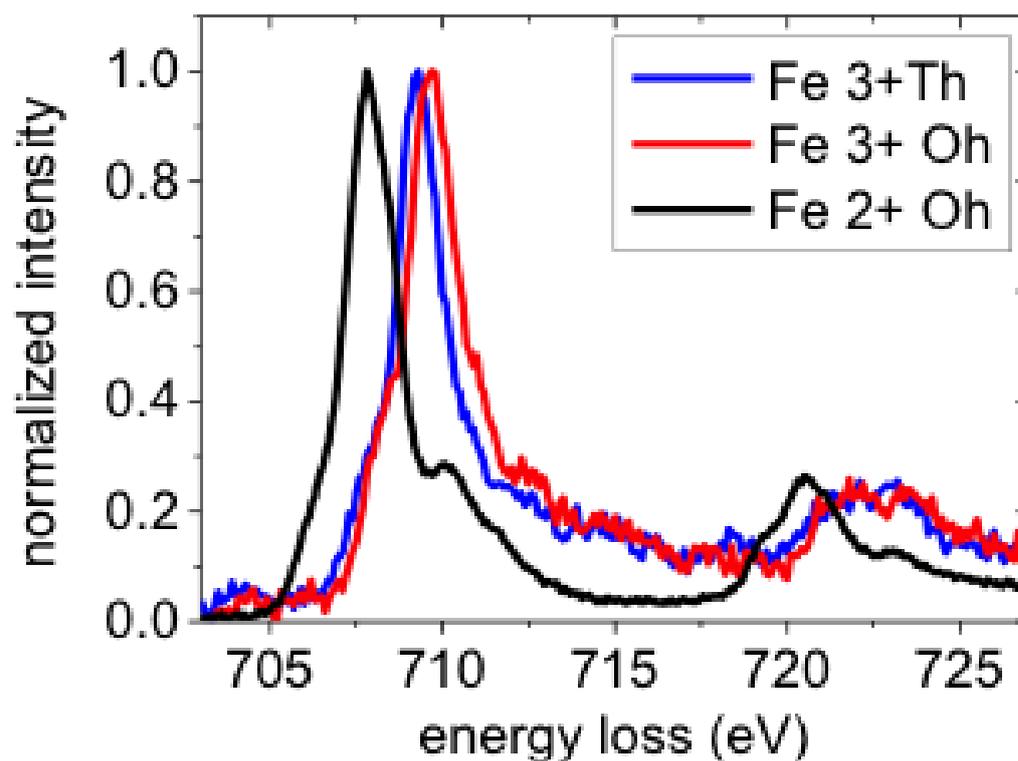


Figure S3: Reference Fe F L_{3,2} EEL spectra for different oxidation and coordination combinations used to perform MLLS analysis of the Fe edge, as shown in Fig. 4 of the manuscript.

Table S1: Integration widths and partial ionization cross-sections used for quantitative analysis of the EEL spectra. The integration widths were chosen to be wider for better averaging, with the exception of Ba and Co due to their overlapping edges. The oxygen ionization cross-section was calculated using DigitalMicrograph (DM) software, while the other cross-sections were calculated relative to that for oxygen by making use of Eq. (1) in the manuscript ².

element	ionization edge	integration width (eV)	partial ionization cross-section (barns)
Fe	L _{3,2}	706.8 - 726.4	1062
Co	L _{3,2}	778.0 - 784.0	352
O	K	528.6 - 568.6	876 ± 88 (DM)
Ba	M _{5,4}	800.0 - 808.0	943
Ti	L _{3,2}	456.0 - 472.0	2496

References

[1] A.-K. Axelsson, F. Aguesse, V. Tileli, M. Valant, and N. M. Alford, *Journal of Alloys and Compounds*, 2013, **578**, 286-291.

[2] R. F. Egerton, *Electron energy-loss spectroscopy in the electron microscope*, Plenum Press., 1986.