Supporting Information.

Visible-light driven water splitting over $BiFeO_3$ photoanodes grown *via* the LPCVD reaction of $[Bi(O^tBu)_3]$ and $[Fe(O^tBu)_3]_2$ and enhanced with a surface nickel oxygen evolution catalyst

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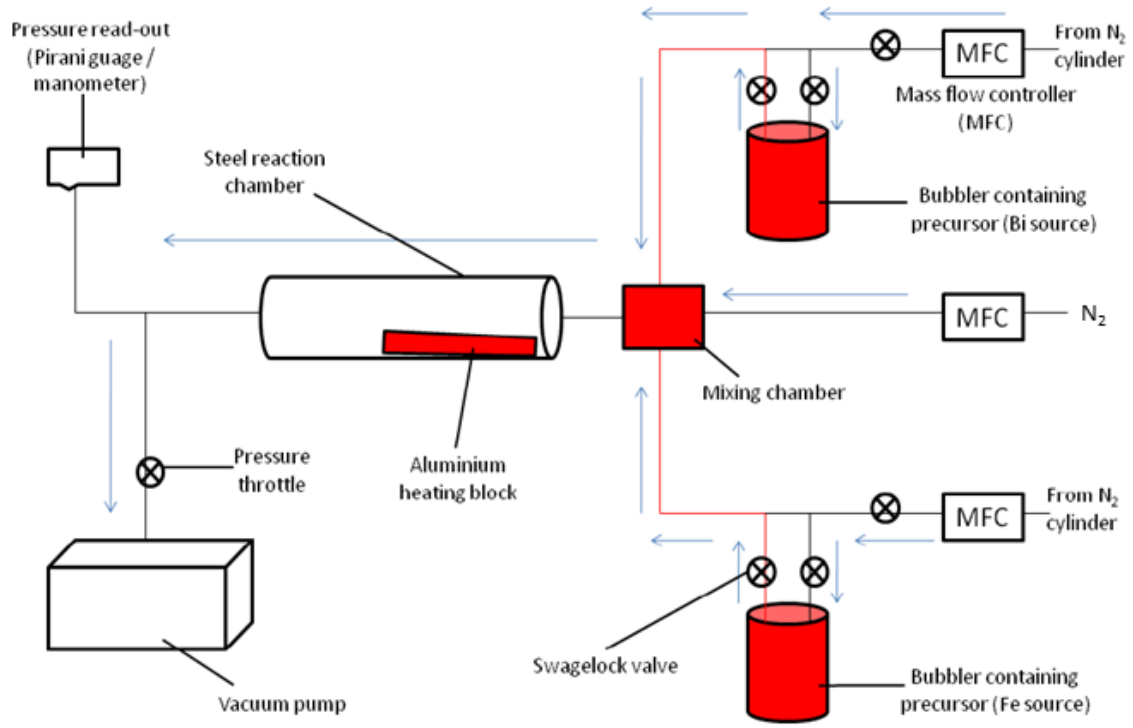

Scheme 1: Schematic diagram of the home-built dual-source LPCVD apparatus for deposition of $BiFeO_3$ films. Objects in red indicate those parts that are controllably heated. Arrows indicate the direction of gas flow.

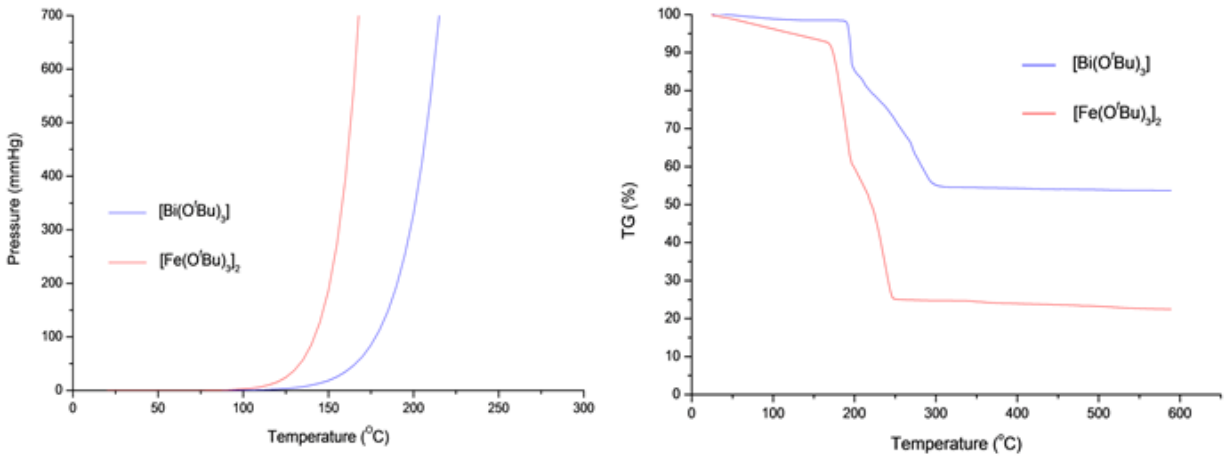

Figure S1: Vapour pressure curves and TGA traces of $[Fe(O^tBu)_3]_2$ and $[Bi(O^tBu)_3]$. The heating rate was 10 °C min^{-1}.

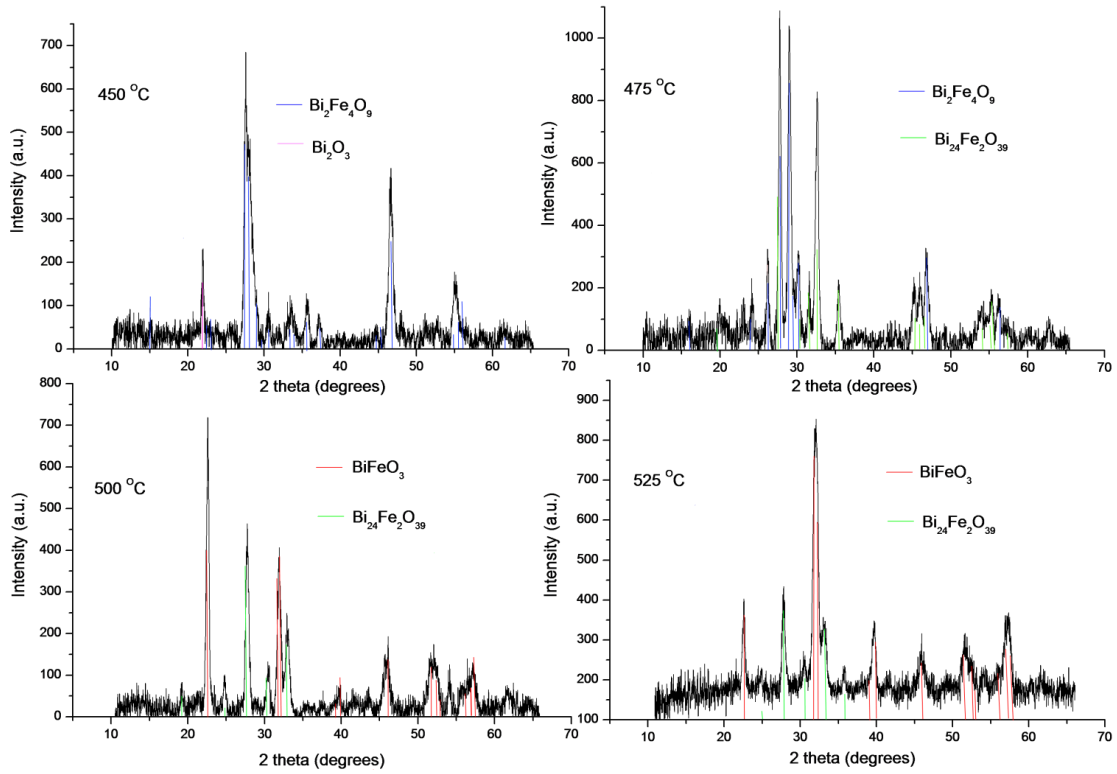

Figure S2: X-ray diffraction patterns of films deposited between 450 - 525 °C.

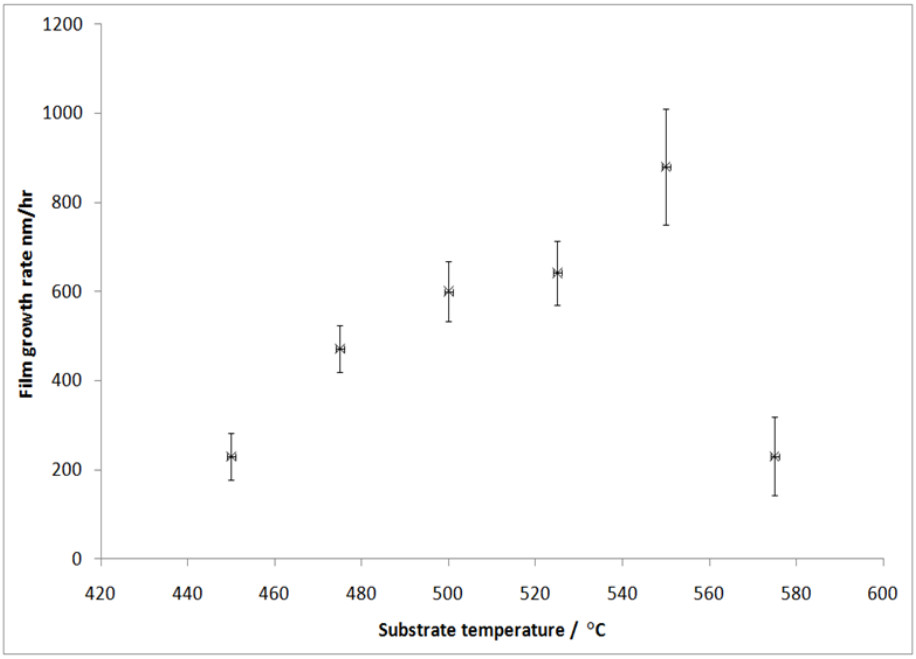

Figure S3: Film growth rates as a function of substrate temperature. The thicknesses were obtained *via* side-on SEM imaging.

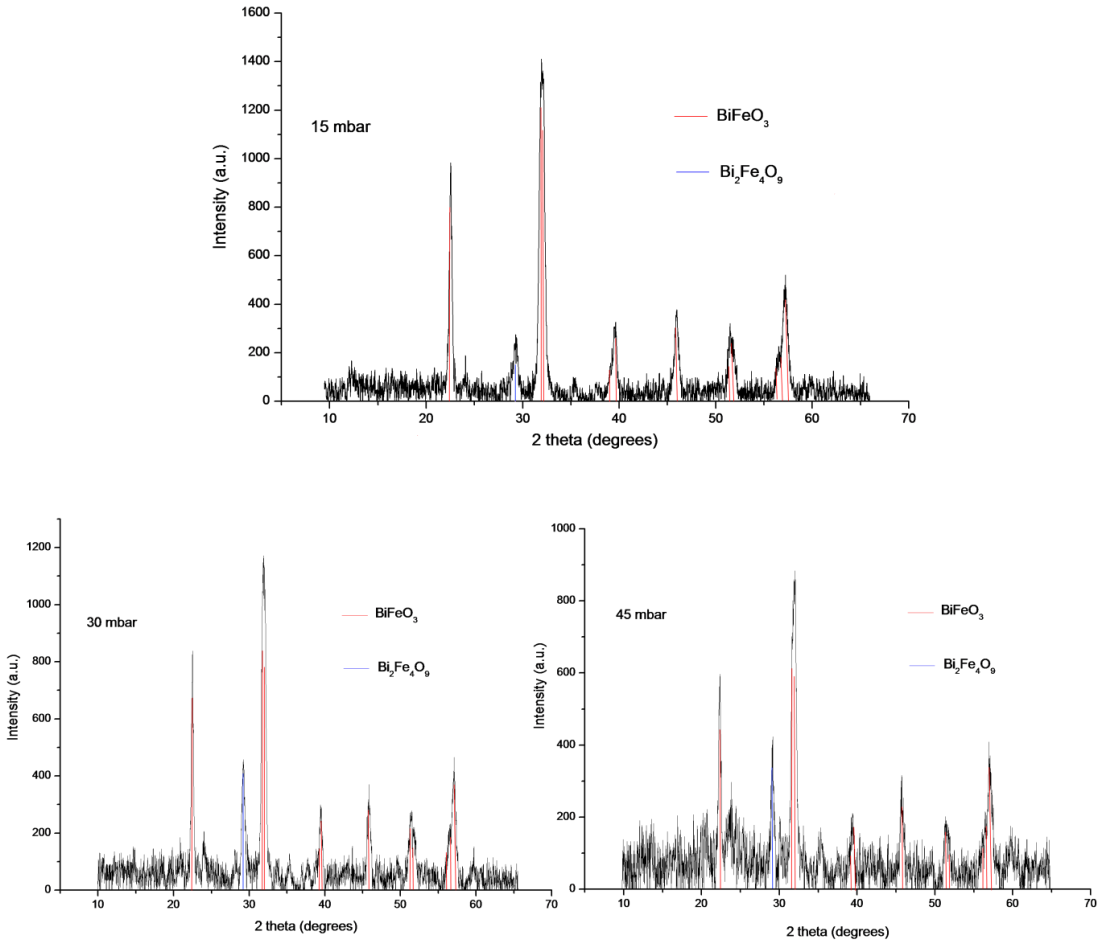

Figure S4: X-ray diffraction patterns of the films deposited at 15 mbar, 30 mbar and 45 mbar.

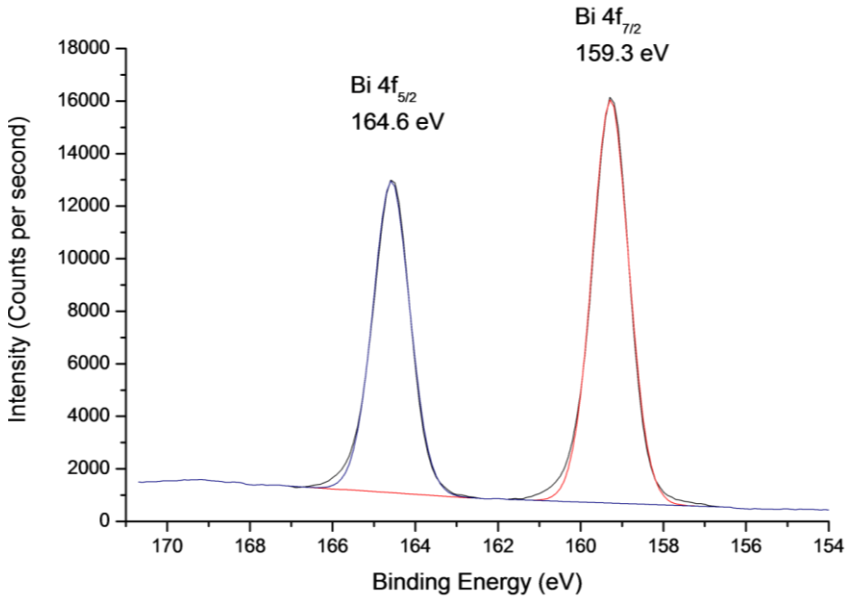

Figure S5: XPS spectrum of the bismuth 4f region.

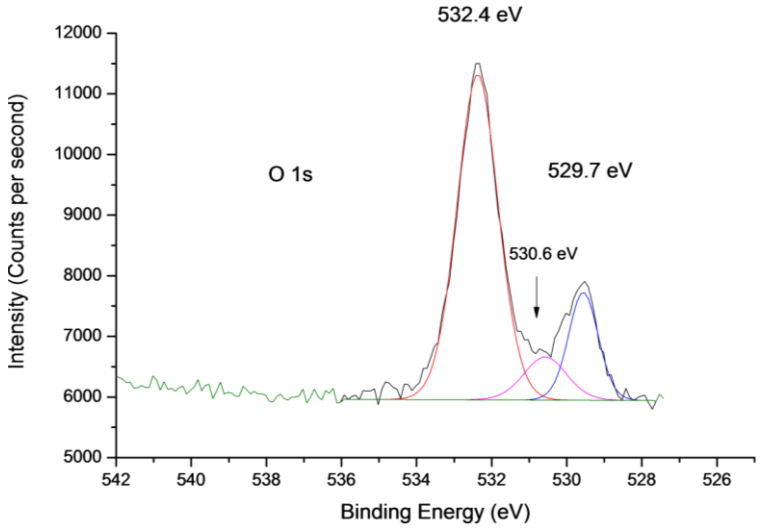

Figure S6: XPS spectrum of the oxygen 1s region.

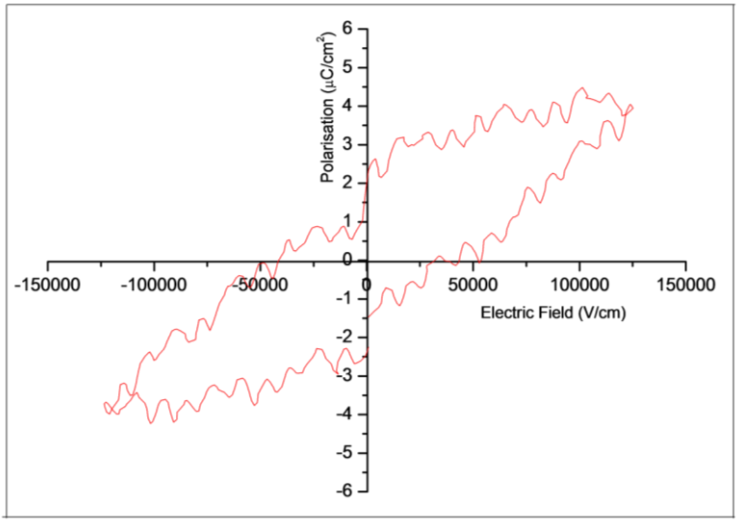

Figure S7: Room temperature P-E hysteresis loop measured at 1 kHz for a 690 nm thick $BiFeO_3$ film deposited on $Pt/SiO_2/Si$ substrate sputtered with Pt top electrodes.

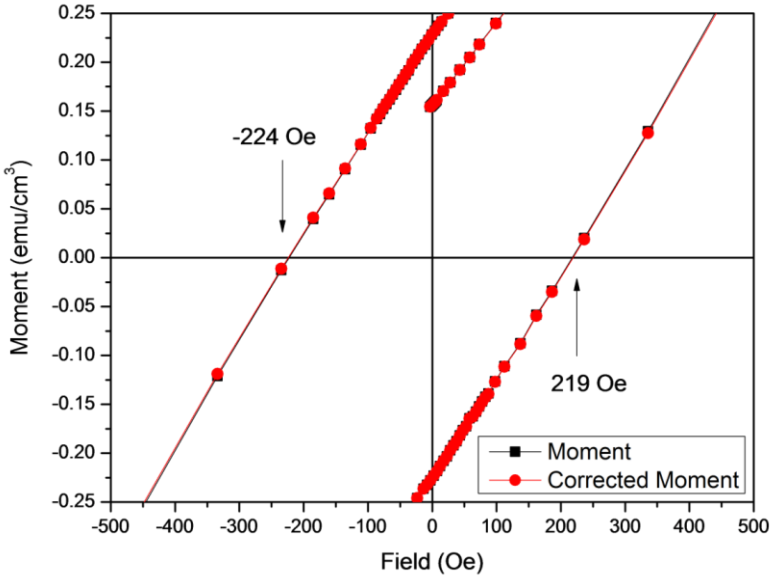

Figure S8: Enlarged M-H hysteresis loop measured at 5 K for the 880 nm thick $BiFeO_3$ film grown *via* LPCVD at 550 °C, 8 mbar, to display the coercivity.

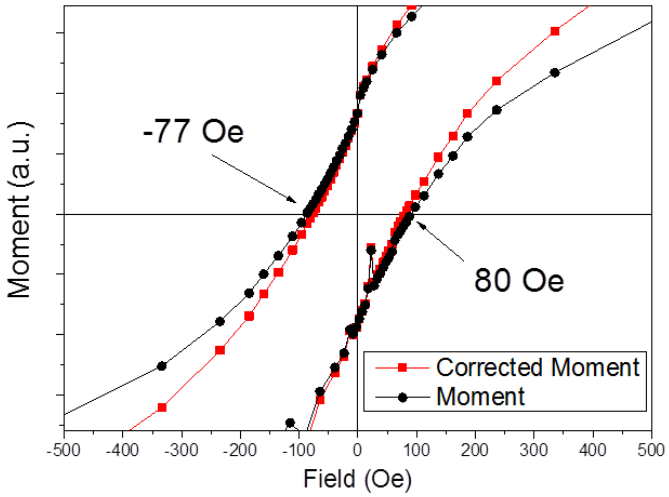

Figure S9: M-H hysteresis loop measured at 300 K for the $BiFeO_3$ film grown *via* LPCVD at 550 °C, 8 mbar. The inset plot shows the M-H curve enlarged to display the coercive field of the sample.

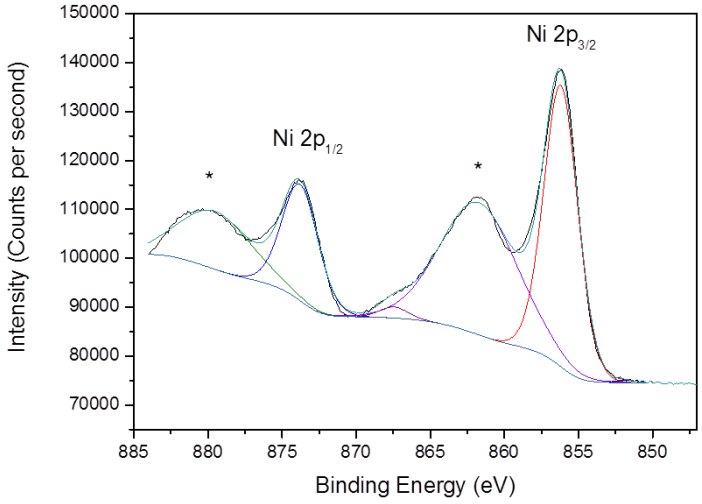

Figure S10: XPS spectrum of the Nickel 2p region from a Ni-B/$BiFeO_3$ film. Asterisks (*) indicate Ni 2p satellite peaks.