Supporting Information (SI)

Development of Charge Carrier-Selective Heterodyne Transient Grating Spectroscopic Technique and Its Application in the Distinction of the Surface Trap States in Hematite

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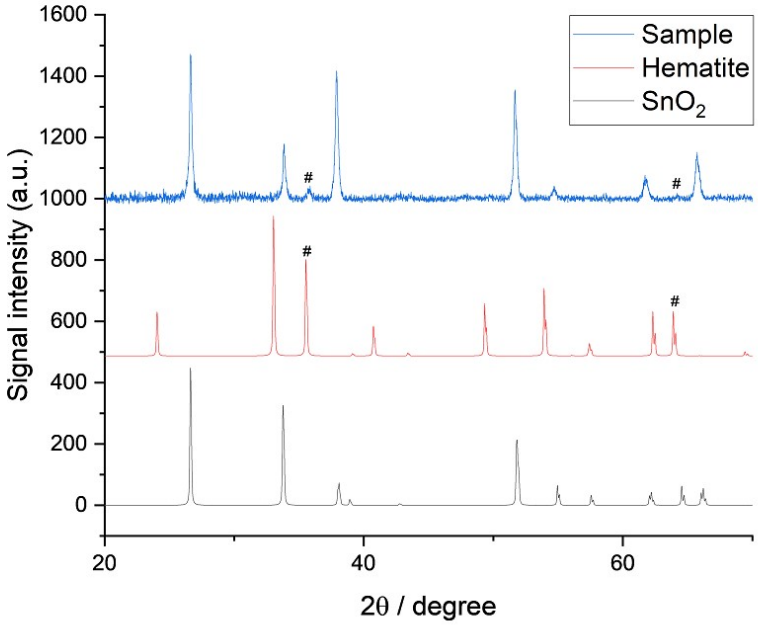

Figure S1 X-ray diffraction (XRD) patterns of the hematite film (blue) with the reference patterns of hematite (red) and SnO_2 (black)

Figure S2 Scanning electron microscopy (SEM) image of the hematite film

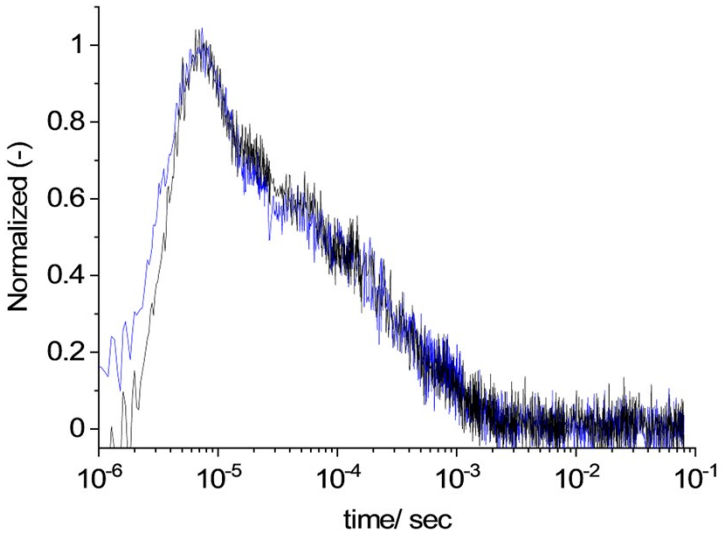

Figure S3 HD-TG responses of the hematite film with (blue) and without (black) the burn laser (830 nm)

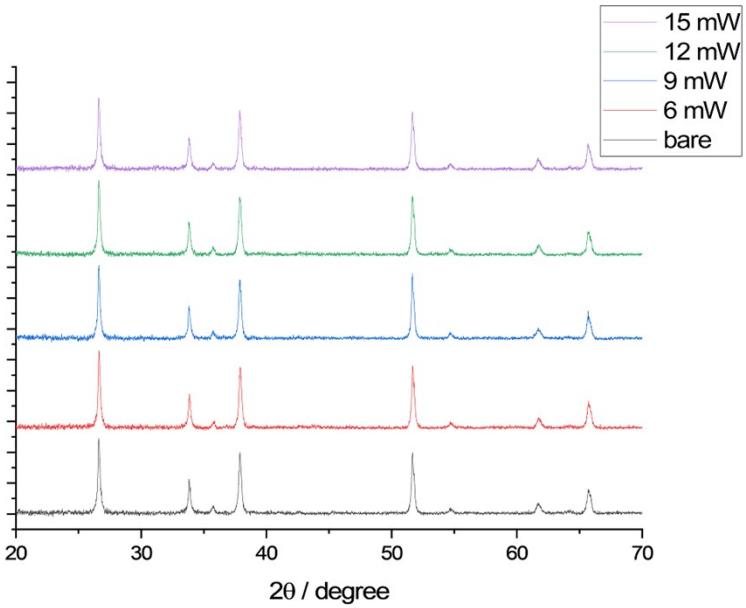

Figure S4 X-ray diffraction (XRD) patterns of the hematite film, observed after the irradiations of the pump, probe and burn lasers. The pump light intensities were varied. The lasers were irradiated on the sample for 1 hour for each measurement. Even under the high pump laser pulse intensity (1.5 mJ), the crystal structure of hematite was not changed and any peaks originating from the decomposition were not observed.