Electronic Supplementary Information

Fe_2O_3-TiO_2 nanosystems by an hybrid PE-CVD/ALD approach: controllable synthesis, growth mechanism, and photocatalytic properties

*Davide Barreca,[a] Giorgio Carraro,[b] Michael E. A. Warwick,[b] Kimmo Kaunisto,[b,c] Alberto Gasparotto,[b] Valentina Gombac,[d] Cinzia Sada,[e] Stuart Turner,[f] Gustaaf Van Tendeloo,[f] Chiara Maccato,[*b] Paolo Fornasiero[*d]*

[a] *CNR-IENI and INSTM, Department of Chemistry, Padova University, Padova, Italy.*

[b] *Department of Chemistry, Padova University and INSTM, 35131 Padova, Italy.*

[c] *Department of Chemistry and Bioengineering, Tampere University of Technology, 33101 Tampere, Finland.*

[d] *Department of Chemical and Pharmaceutical Sciences, ICCOM-CNR Trieste Research Unit - INSTM Research Unit, Trieste University, 34127 Trieste, Italy.*

[e] *Department of Physics and Astronomy, Padova University, 35131 Padova, Italy.*

[f] *EMAT - University of Antwerp, 2020 Antwerpen, Belgium.*

[*] Authors to whom correspondence should be addressed; e-mail: chiara.maccato@unipd.it (C.M.); pfornasiero@units.it (P.F.).

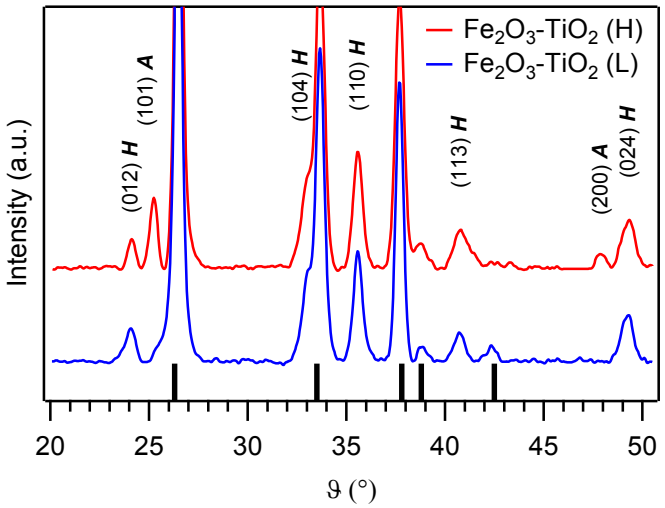

Fig. S1. XRD patterns of Fe_2O_3-TiO_2 specimens. Reflections pertaining to the FTO substrate are marked by vertical black bars. The observed signals could mainly be indexed with those pertaining to the rhombohedral *hematite* (***H***) phase.[1] For the higher *titania* thickness [sample Fe_2O_3-TiO_2 (H)], some reflections related to *anatase* (***A***) TiO_2[2] were also detected.

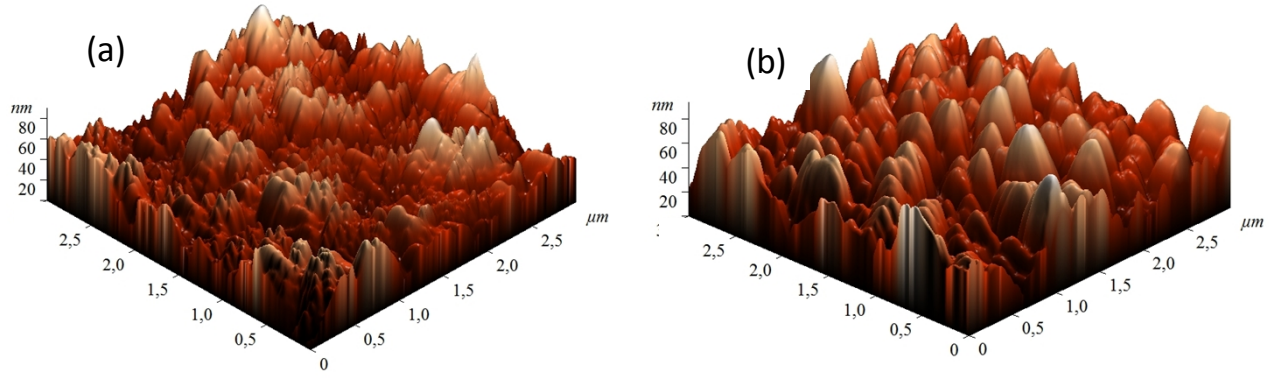

Fig. S2. Representative AFM micrographs for: (a) Fe_2O_3-TiO_2 (L); (b) Fe_2O_3-TiO_2 (H) samples. RMS values are close to 15 nm for both specimens.

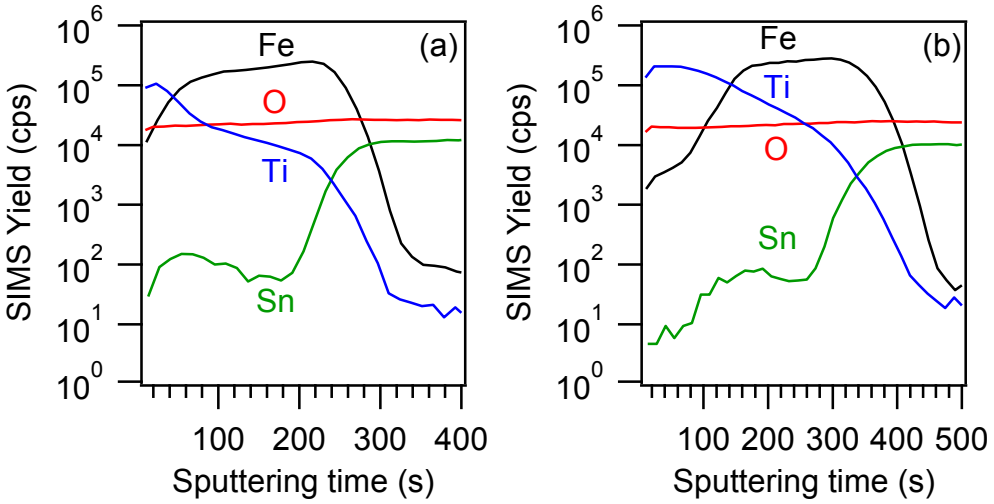

Fig. S3. SIMS depth profiles for (a) Fe_2O_3-TiO_2 (L) and (b) Fe_2O_3-TiO_2 (H) samples.

References

1. Pattern N° 33-0664 JCPDS (2000).
2. Pattern N° 00-021-1272, JCPDS (2000).