# Electronic Supporting Information for

# Micro-Mesoporous Iron Oxides with Record Efficiency for Decomposition of Hydrogen Peroxide: Morphology Driven Catalysis for Degradation of Organic Contaminants

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Number of figures: 6

## Supporting Figures

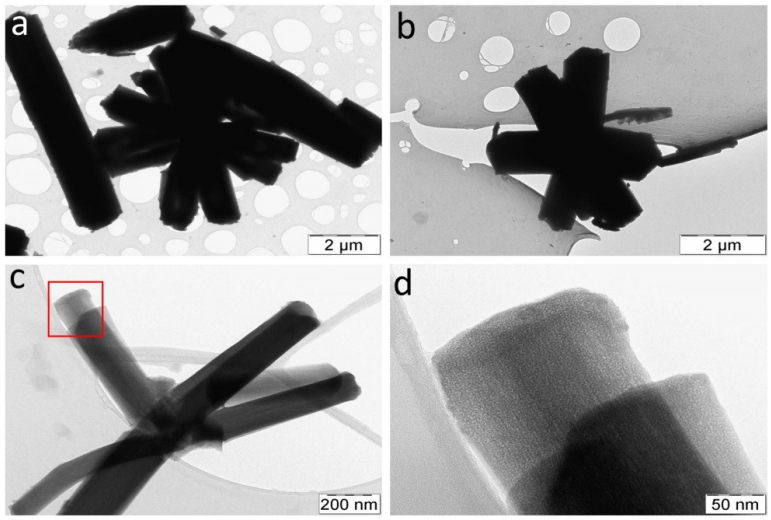


**Fig. S1** (a-c) TEM images of the FIO sample. (d) Higher magnification of the highlighted rectangular box shown in (c) indicating the mesoporous nature of the catalyst.

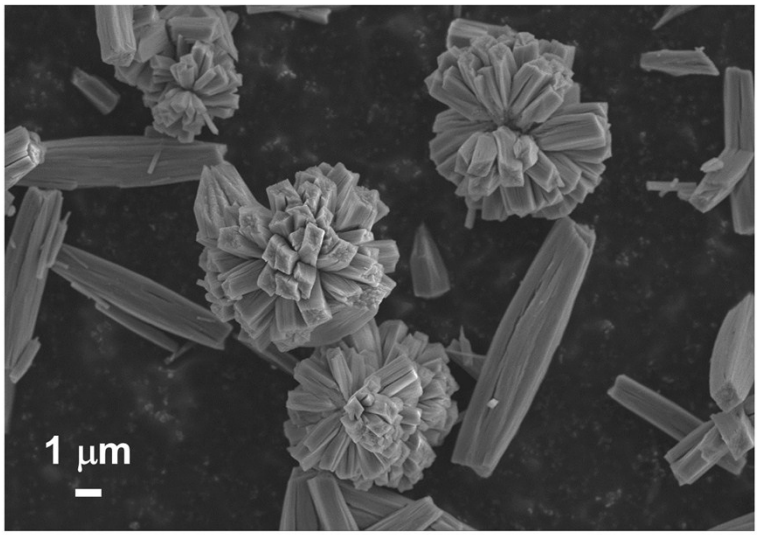


**Fig. S2** FESEM image showing the morphological yield and the clear 3D organization of the FIO sample.

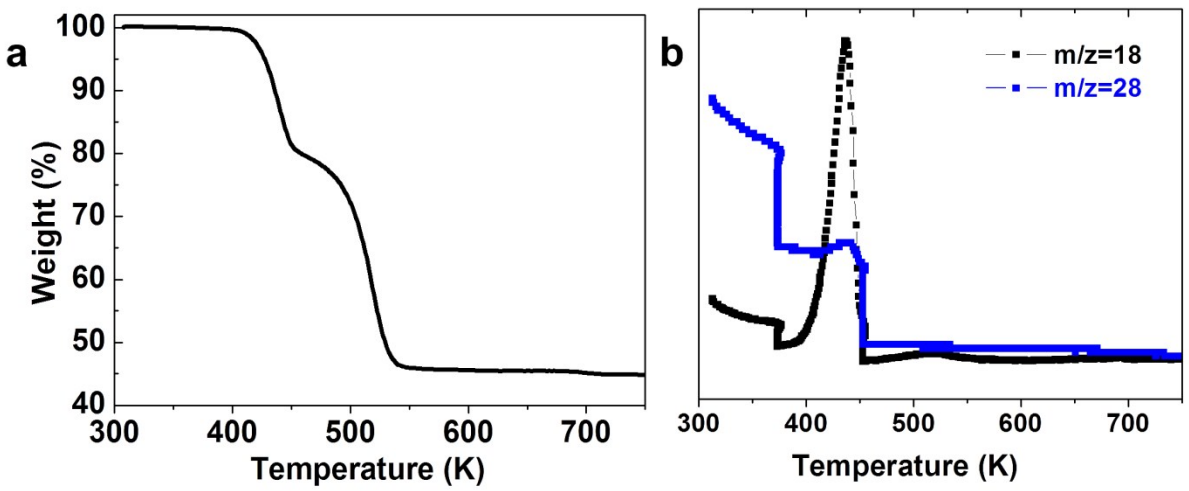


**Fig. S3** (a) TGA of the as-prepared iron(II) oxalate precursor showing two-step decomposition corresponding to primary dehydration (mass loss of 19.8 wt %) and secondary oxidative decomposition to iron(III) oxide (34.5 wt %). (b) Evolved gas mass analysis of iron(II) oxalate precursor showing the liberation of CO, $H_2O$ respectively.

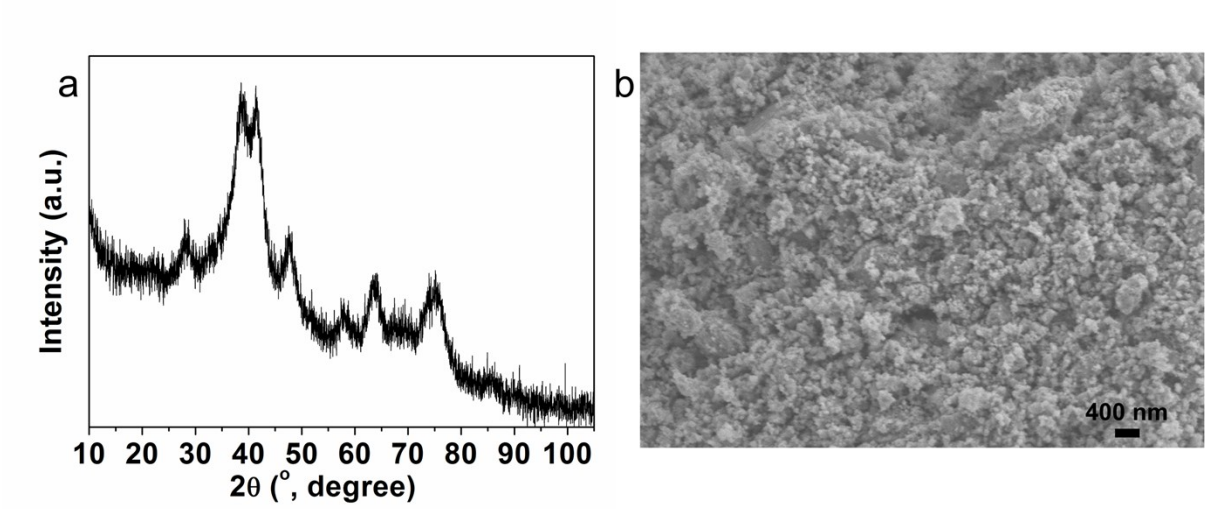


**Fig. S4** a) XRD pattern and FESEM image of the CIO sample.

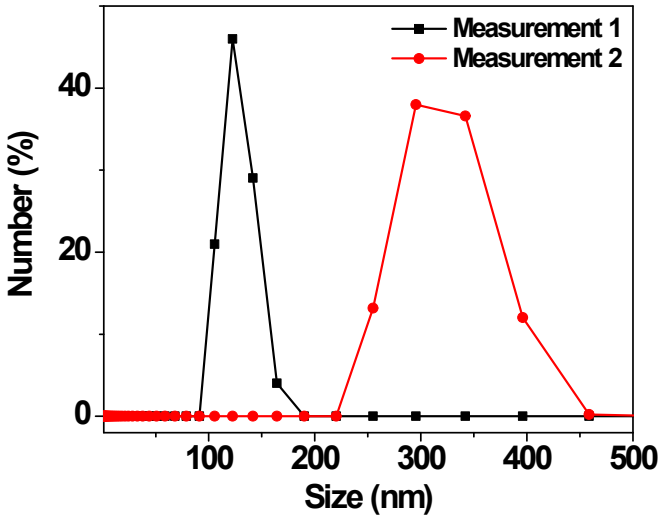


**Fig. S5** DLS size distribution of particles/aggregates in the CIO sample measured after 60 seconds (measurement 1) and 130 seconds (measurement 2) demonstrating a high tendency of CIO catalyst towards aggregation. The used concentration of 1 mg/mL, the same as for hydrogen peroxide decomposition.

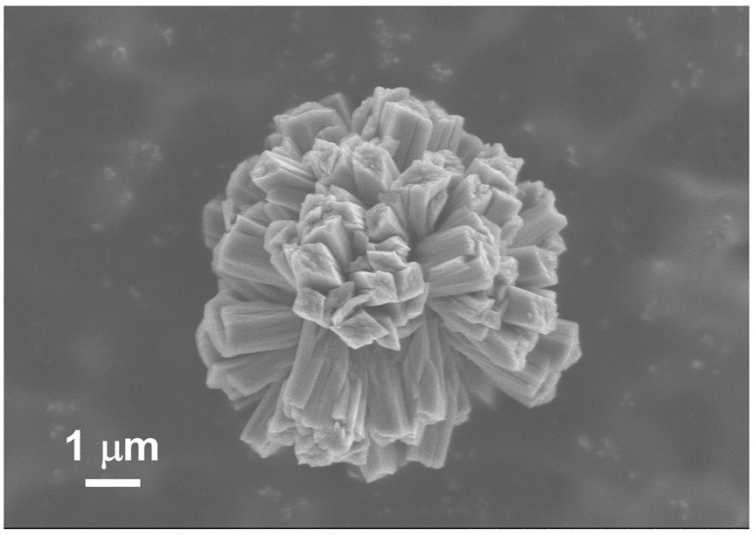


**Fig. S6** FESEM image of FIO sample after reusing it for three catalytic cycles against phenol degradation.