Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Electronic Supplementary Information

Novel Spherical Hierarchical Structures of GdOOH and Eu:GdOOH: Rapid Microwave-Assisted Synthesis Through Self-Assembly, Thermal conversion to Oxides, and Optical Studies

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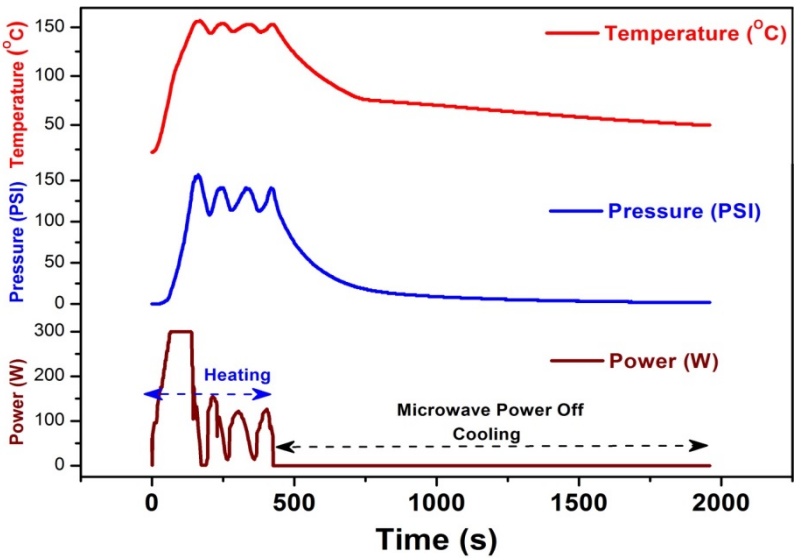

Fig. S1 Variation of process parameters with time, during the microwave-assisted formation of GdOOH hierarchical structures.

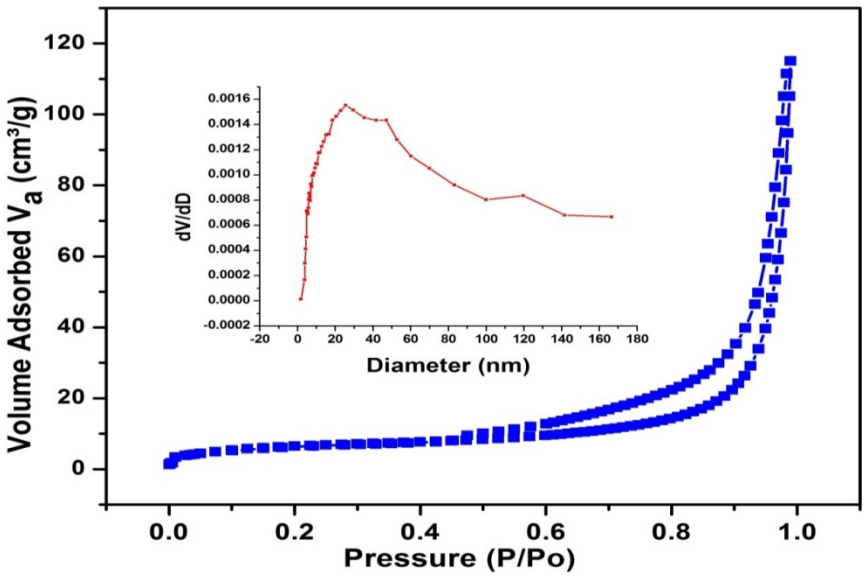

Fig. S2 Adsorption and desorption isotherm for GdOOH microspheres. The inset shows BJH pore size distribution.

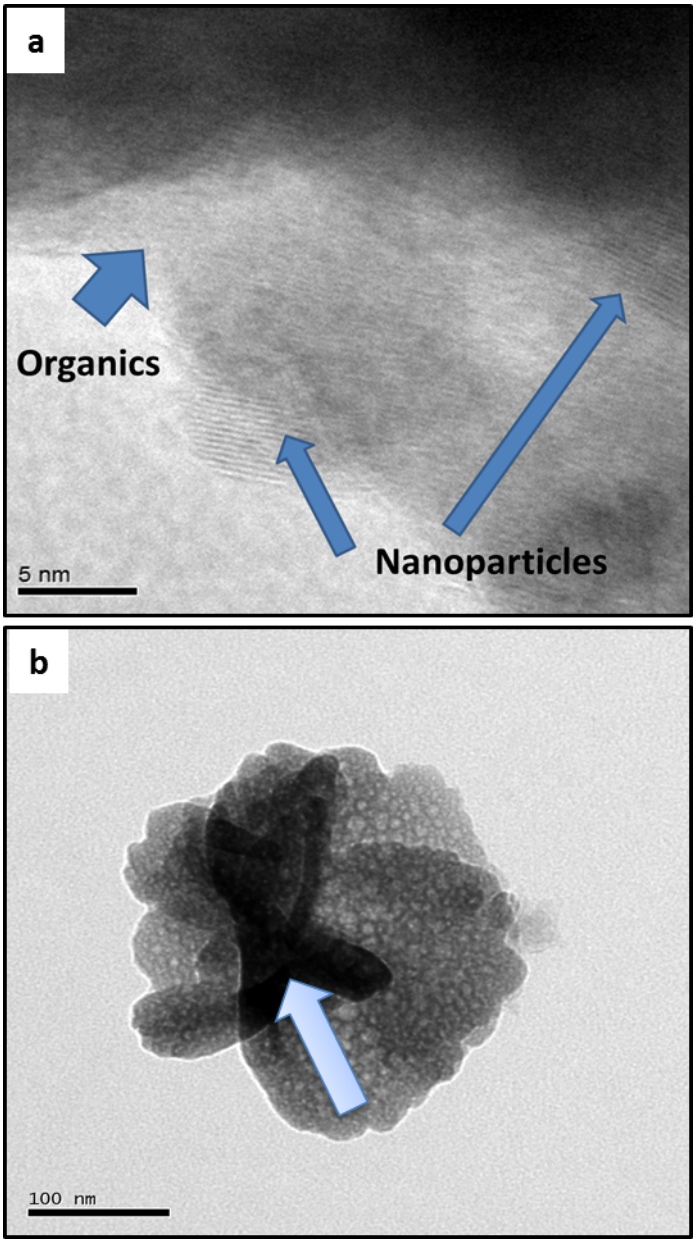

Fig. S3 (a,b) A high-magnification TEM images of a single nanoflake showing the sparse distribution of nanocrystals of GdOOH in a non-crystalline (organic) matrix that forms the "glue". The nanocrystals thus have extensive "organic capping", which is the reason for a lighter-than-expected contrast where the nanoparticles are present. The presence of "darker contrast" in some regions may be due to a change in local concentration of GdOOH moieties or the thickness variations within the nanoflake. Evidence for the latter can be seen in (b) where dark fringes due to the overlapping edges of a single nanoflake are present.

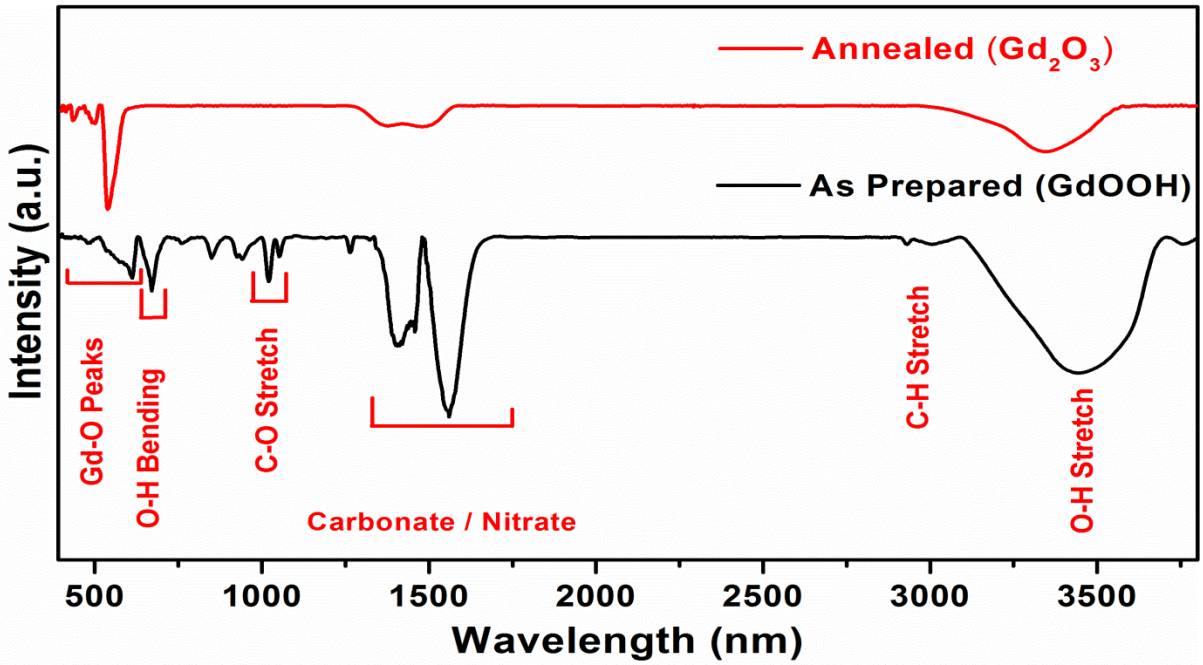

Fig. S4 Infrared spectrum of as-prepared GdOOH product showing the presence of ethanolic peaks. No signature of ethanol is present in the annealed Gd_2O_3 product as expected.

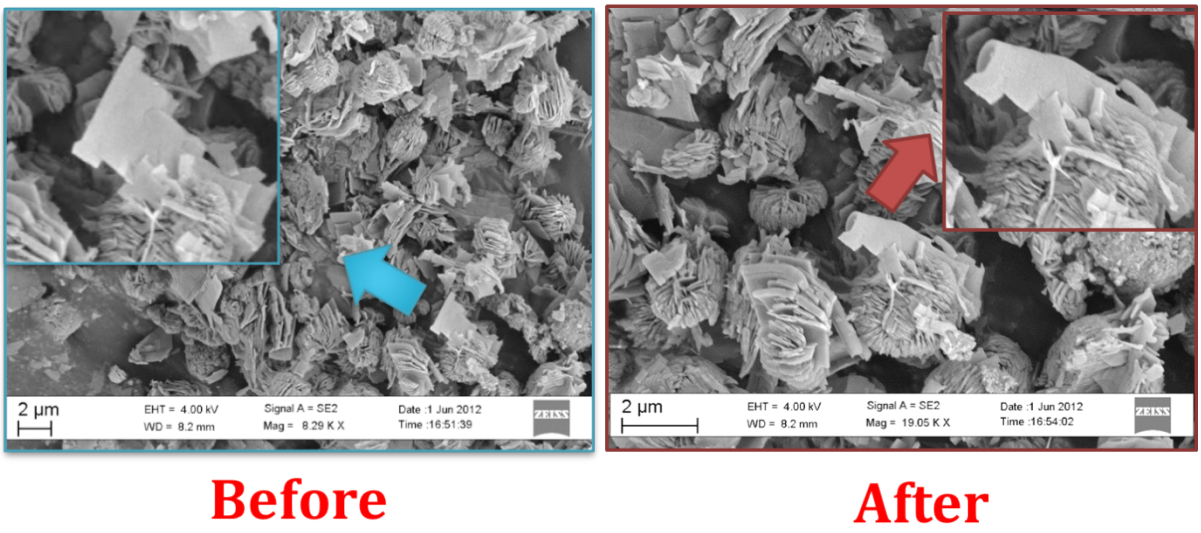

Fig. S5 SEM micrographs of a single nanoflake before and after exposure to the e-beam.

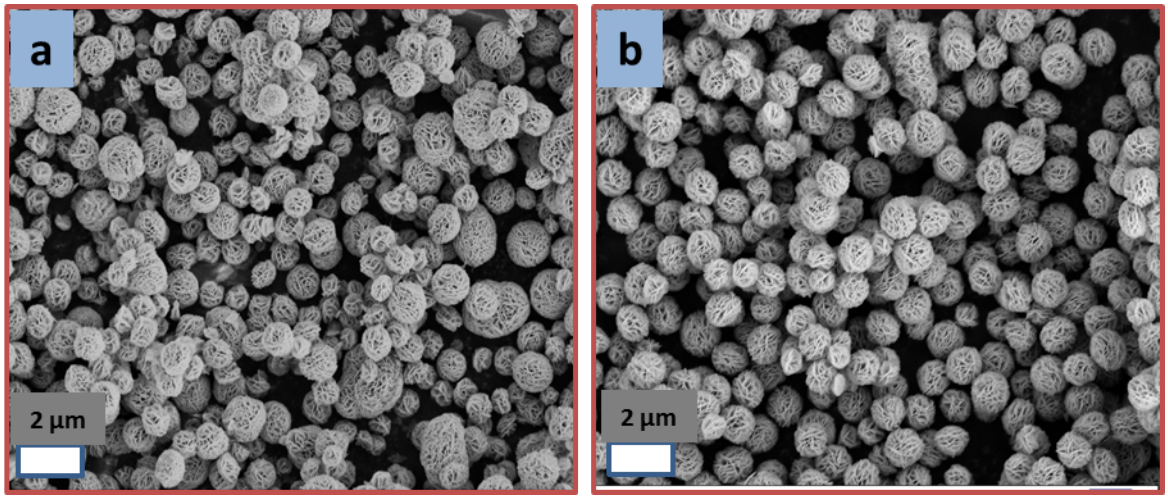

Fig. S6 Morphology of the as-prepared GdOOH microspheres obtained (a) after run time of 8 min and (b) keeping the magnetic stirring on during microwave irradiation.

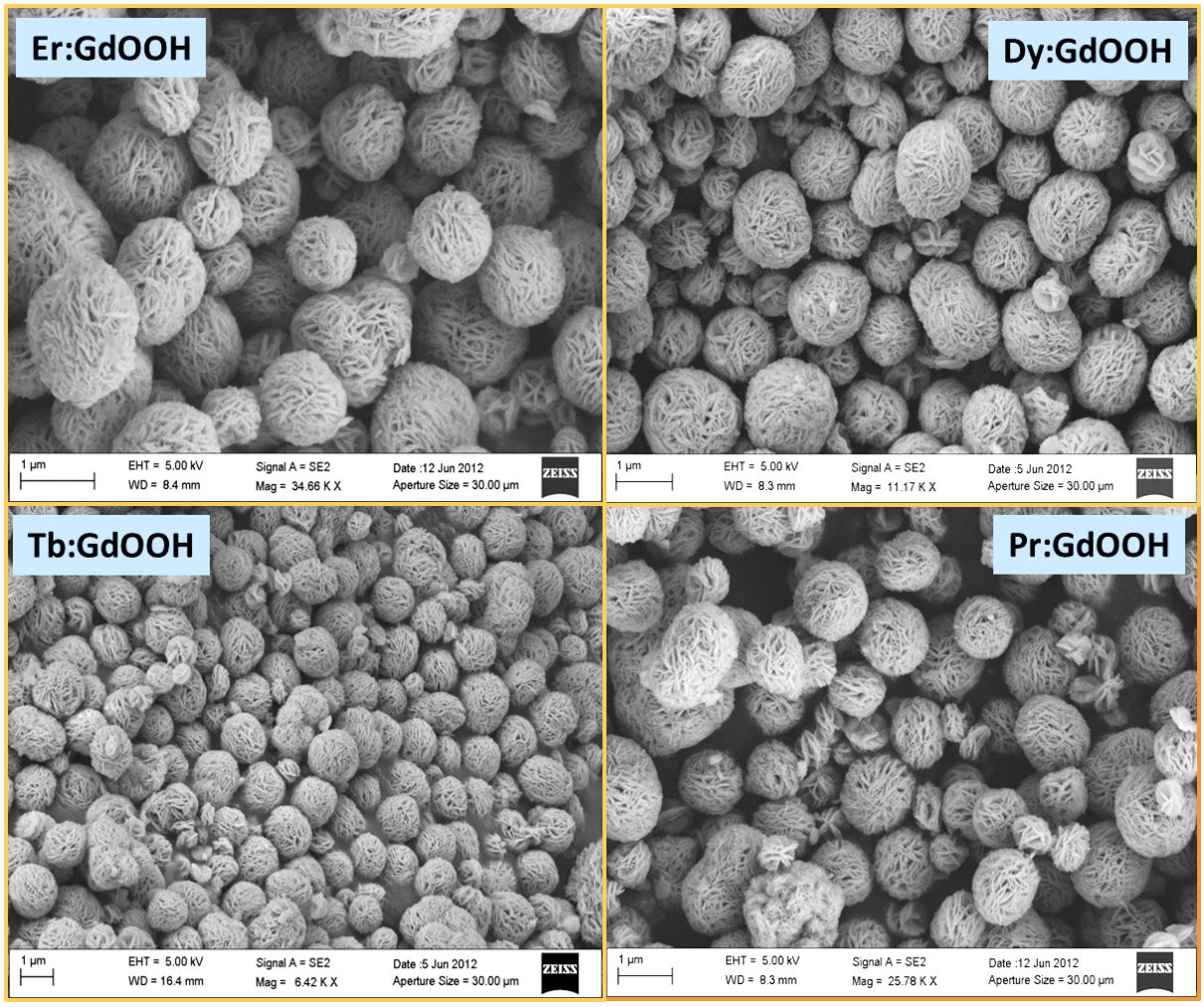

Fig. S7 SEM micrographs of GdOOH spherical hierarchical structures prepared by the microwave irradiation route, and doped respectively with Er, Dy, Tb, and Pr,.