

Supplementary Information

A General and Mild Route to Highly Dispersible Anisotropic Magnetic Colloids for Sensing Weak Magnetic Fields

Shumin Zhang^{a†}, Chaoran Li^{a†}, Yingying Yu^a, Zhijie Zhu^a, Weihu Zhang^b, Rujun Tang^b, Wei Sun^c, Wenhe Xie^a, Yunxing Li^d, Jia Yu^a, Le He^{a*} and Xiaohong Zhang^{a*}

^a*Institute of Functional Nano & Soft Materials (FUNSOM), Jiangsu Key Laboratory for Carbon-Based Functional Materials & Devices, Soochow University, 199 Ren'ai Road, Suzhou, 215123, Jiangsu, PR China*

^b*Jiangsu Key Laboratory of Thin Films, College of Physics, Optoelectronics and Energy, Soochow University, Suzhou, 215006, Jiangsu, PR China*

^c*Department of Chemistry, University of Toronto, 80 St. George Street, Toronto, Ontario, M5S 3H6, Canada*

^d*Key Laboratory of Synthetic and Biological Colloids, Ministry of Education, School of Chemical and Material Engineering, Jiangnan University, Wuxi 214122, P. R. China*

[†]*These authors contribute equally to this work.*

^{*}*Email - lehe@suda.edu.cn*



Figure S1. Digital photo of the reduced products of sample S4 at 300 °C for different periods.

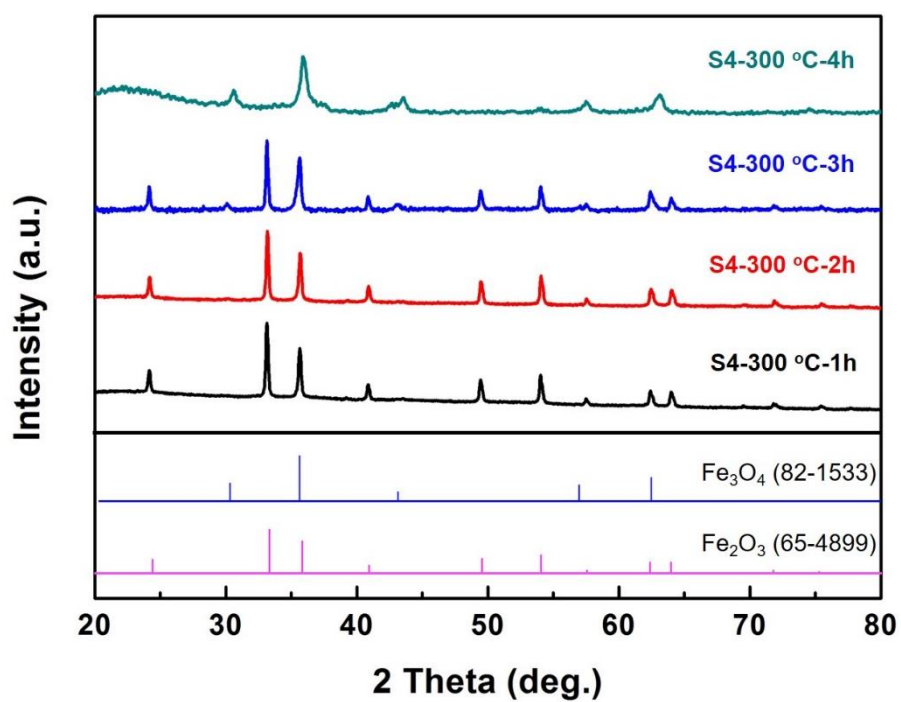


Figure S2. XRD patterns of the reduced products of sample S4 at 300 °C for different periods.

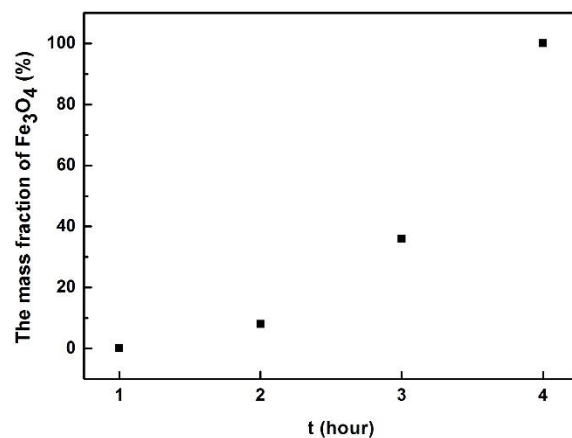


Figure S3. The plot of the mass fraction of Fe_3O_4 in the reduced products of sample S4 versus the reducing time at 300 °C.

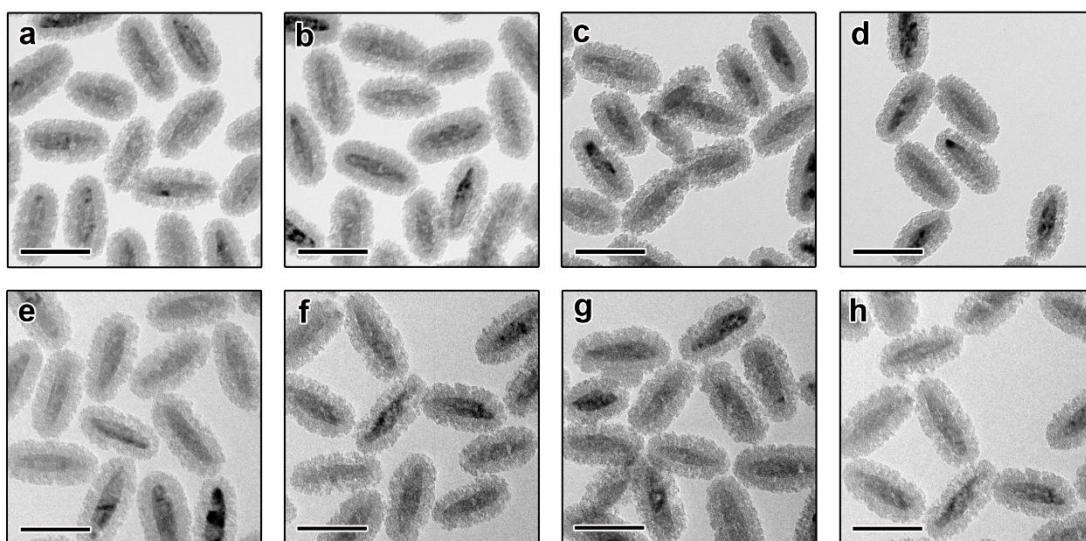


Figure S4. TEM images of reduced products from S3 (a-d) and S4 (e-h) by H_2 . The reducing temperature is 300 °C for (a, e), 350 °C for (b, f), 400 °C for (c, g) and 450 °C for (d, h). Scale bars are 200 nm.

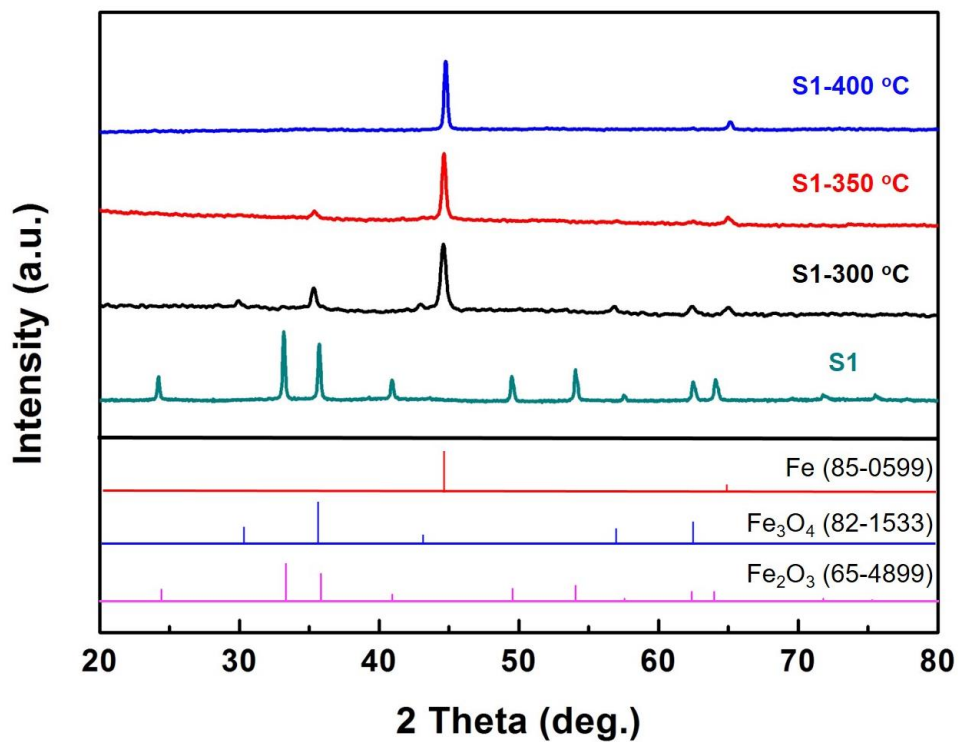


Figure S5. XRD patterns of sample S1 and its reduced products at different temperatures.

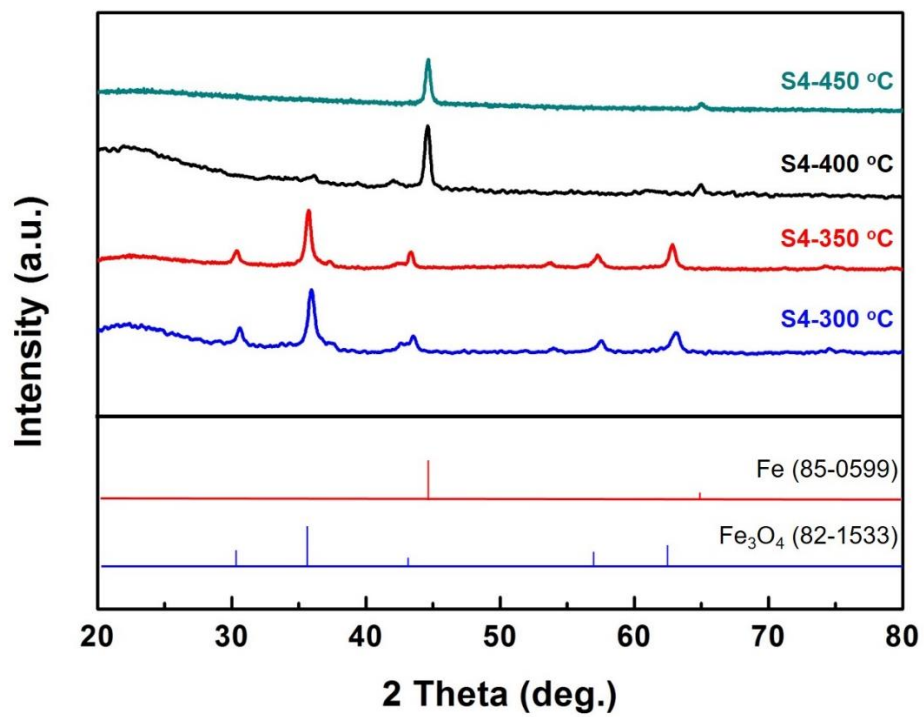


Figure S6. XRD patterns of the reduced products of sample S4 at different temperatures.

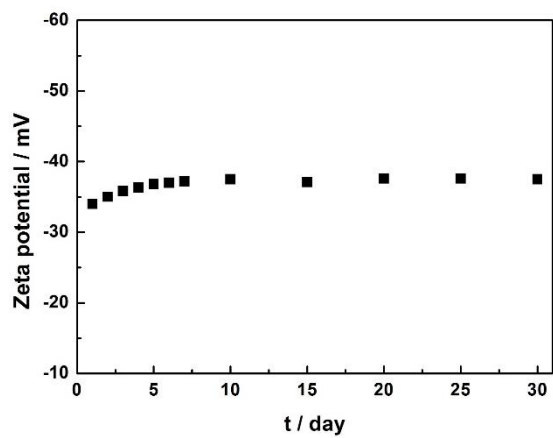


Figure S7. Evolution of zeta potential values of sample S4-350 dispersed in deionized water during the storage for 30 days.

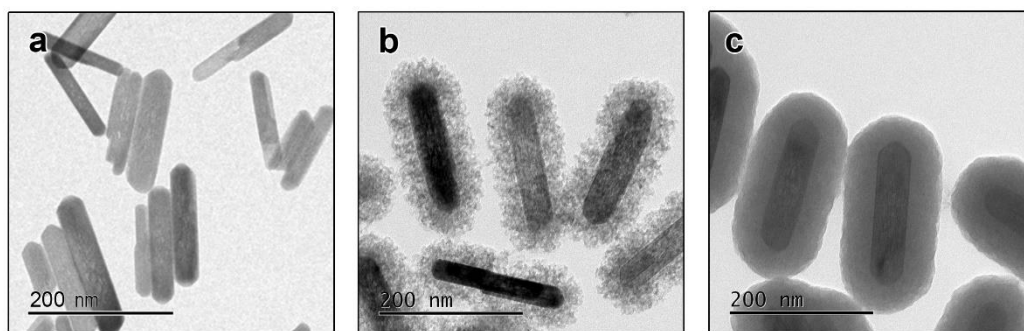


Figure S8. TEM images of (a) β -FeOOH, (b) β -FeOOH@p-SiO₂ and (c) β -FeOOH@SiO₂ nanorods.

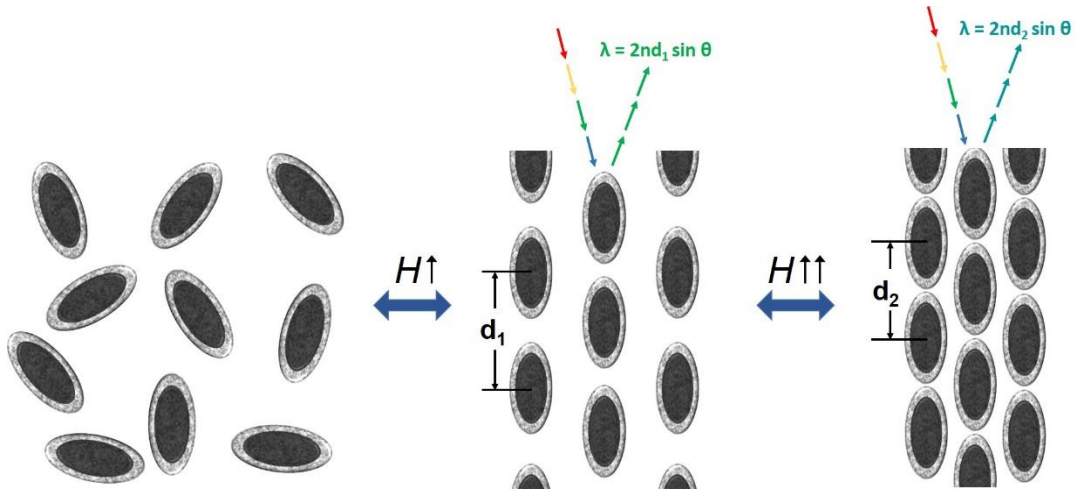


Figure S9. Schematic illustration of the magnetic assembly and tuning of 1D photonic chains of ellipsoidal particles.