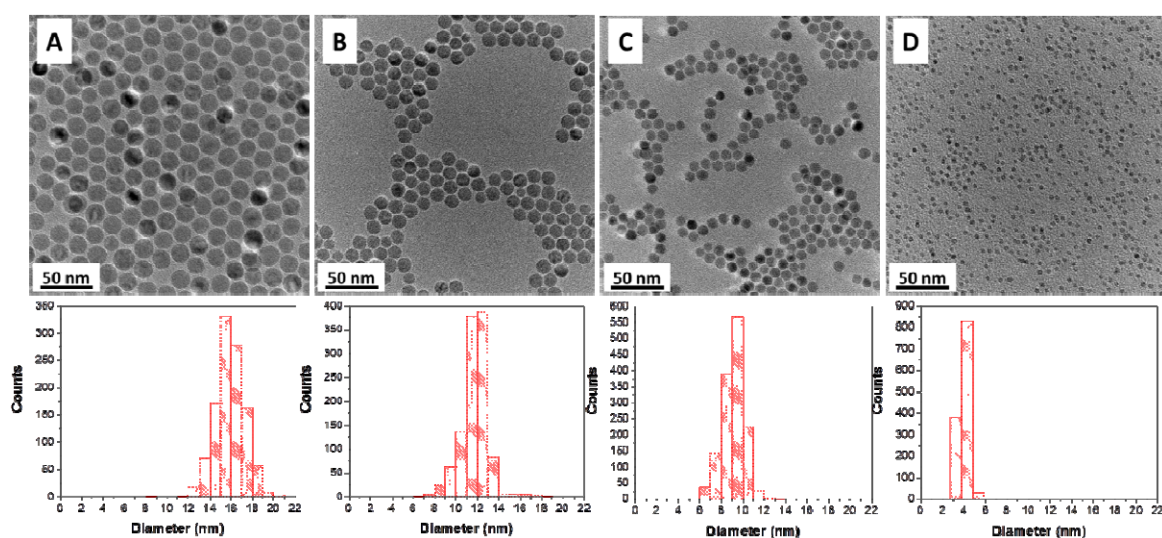
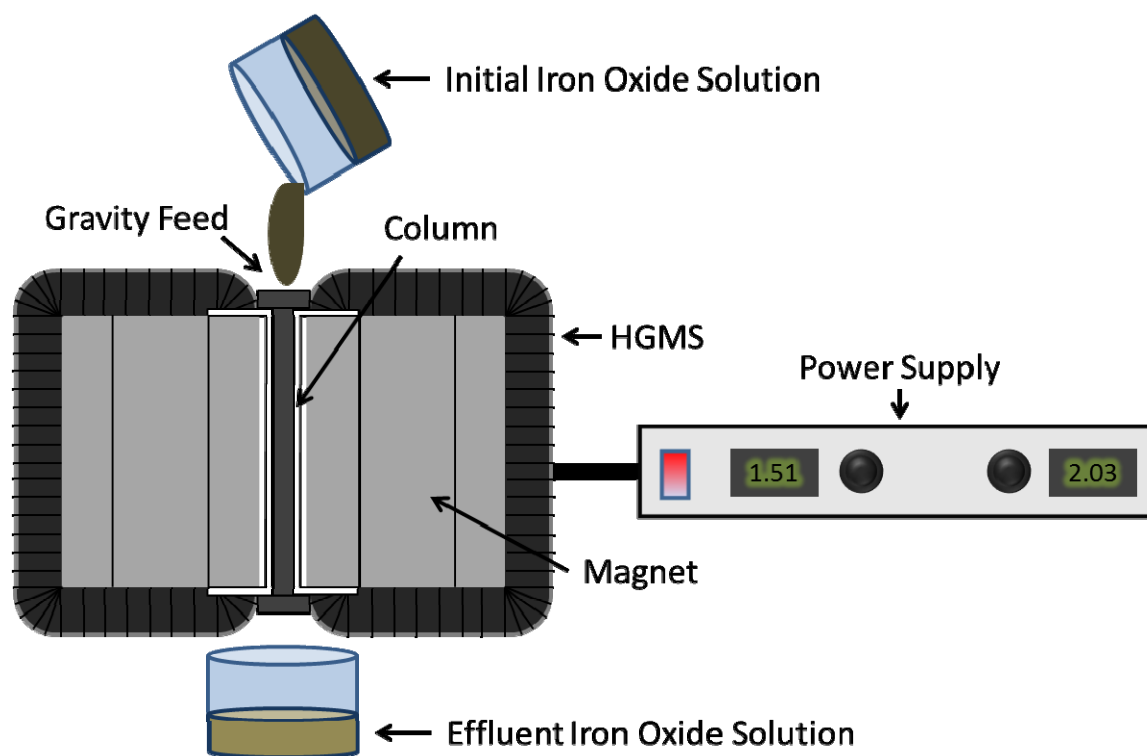


Nanoscale iron oxide reaction details:

Four sizes of iron oxide nanocrystals were synthesized based on a method reported previously.¹ The 4.0 nm iron oxide nanocrystals were synthesized by the thermal decomposition of 0.045 mmol iron oleate with 2 mmol oleic acid in 20 mmol 1-octadecene at 320 °C for 2 h. The 9.2 nm iron oxide was prepared by 1 mmol FeO(OH) with 3 mmol oleic acid in 40 mmol 1-octadecene at 320 °C for 30 min. The 11.7 and 15.9 nm iron oxide were prepared by reacting 10 mmol FeO(OH) with 40 mmol oleic acid in 28 mmol 1-octadecene at 320 °C for 1 h and 3h, respectively.



Supplementary Fig. S1 TEM images of (a) 15.9 ± 1.4 nm, (b) 11.7 ± 1.1 nm, (c) 9.2 ± 1.0 nm, and (d) 4.0 ± 0.4 nm nanoscale iron oxide samples that were mixed to create the tetramodal sample. Histograms are displayed below each image to show the size distribution.



Supplementary Fig. S2 Schematic of the gravity feed HGMS experimental setup. The magnetic field strength is adjusted with the power supply and the iron oxide nanoparticle solution is passed through the column packed with stainless steel wool. The solution flow is gravity fed and only restricted by the packing density. Effluent is collected below.

References

1. W. W. Yu, J. C. Falkner, C. T. Yavuz and V. L. Colvin, *Chem. Commun.*, 2004, 2306-2307.