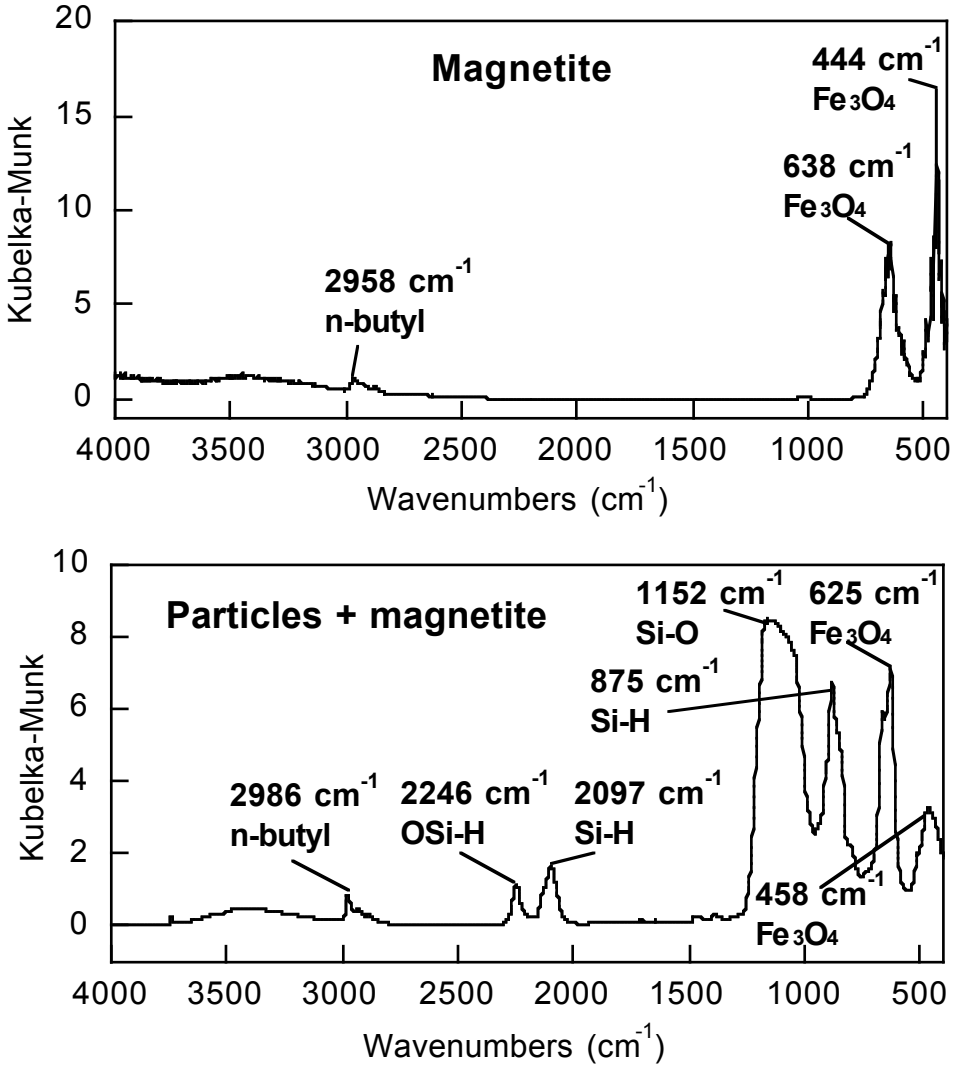
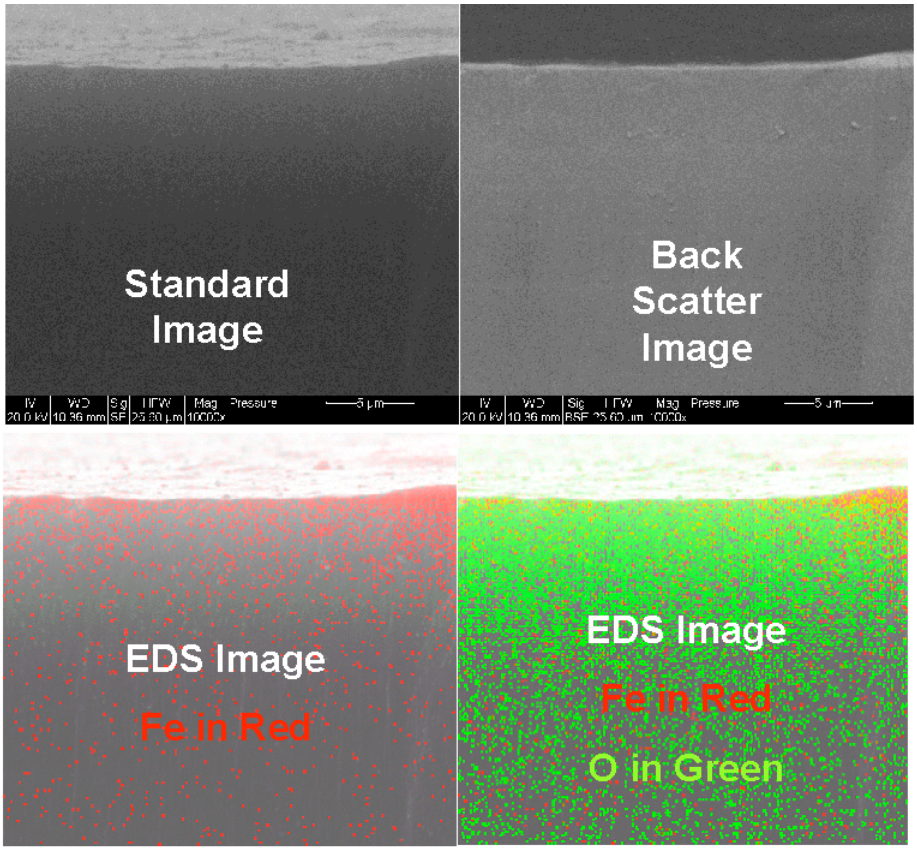
Supplementary Figures



Supplementary Figure 1. Diffuse reflectance Fourier transform infrared (FTIR) spectra of magnetite prepared as described in the text (top), and a layer of a freshly etched porous Si film after treatment with the magnetite nanoparticles (bottom), showing the presence of magnetite and the oxidation that occurs during the magnetite infusion process.



Supplementary Figure 2. Cross-sectional electron microscope analysis of a porous Si film treated with Fe_3O_4 nanoparticles. Secondary electron image (upper left) showing the porous silicon film. Backscattered electron image is shown in upper right. The X-ray spectral maps, shown at the lower left and right, confirm the presence of Fe in the nanostructure.

Caption for Supplementary Movie Clip. The movie shows two droplets (4mm diameter) containing encoded chaperones submersed in a solution of octadecene containing 5% CH_2Cl_2. The chaperones on the left exhibit a single peak spectral bar code and contain 0.1 M $KI_{(aq)}$. The chaperones on the right exhibit a double peak spectral bar code and contain 0.1M $AgNO_{3(aq)}$. Both particle/droplet assemblies respond to a magnet held underneath the Al dish, and are combined under the influence of this magnet to form a single drop. Within this single drop the $I^-_{(aq)}$ and $Ag^+_{(aq)}$ combine to form a yellow/white precipitate of AgI. The mixture of chaperone particles on the outside of the drop now display a triple peak spectral bar code, as shown in Fig. 4 of the text.