## **SUPPORTING INFORMATION**

## Ultra-long Magnetic Nanochains for Highly Efficient Arsenic Removal from Water

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**Figure S1.** Photograph of the nanochain layers deposited on to the filter paper for filtration.



**Figure S2.** Large area SEM images of the layers of  $\gamma$ -Fe<sub>2</sub>O<sub>3</sub> nanochains on the filter paper.



**Figure S3.** (Top) Nitrogen adsorption-desorption isotherms of the nanochains showing a surface area of 151.12 m<sup>2</sup>g<sup>-1</sup>. (Bottom) Powder XRD pattern of the nanochains confirms the crystallinity of the materials matches with  $\gamma$ -Fe<sub>2</sub>O<sub>3</sub>.



**Figure S4.** TEM image of thermophoretically collected nanoparticles at the visible tip of the flame under magnetic field; (top) large area image of the collected nanoparticles, (bottom) a magnified view of the formation of small nanochains and coexistence of the ultrasmall nanoparticles.



**Figure S5.** TEM image of thermophoretically collected nanoparticles at the visible tip of the flame under no magnetic field.



Figure S6. TEM image nanoparticles formed random chains (fractal aggregates) without any applied magnetic field.



**Figure S7.** SEM image of the nanoparticles deposition on the filter paper without application of any external magnetic field.