## Electrospun Hematite Nanofiber/ Mesoporous Silica Core/Shell Nanomaterials as an Efficient Adsorbent for Heavy Metals

## **Supplementary Information**

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| Shell Thickness | Water | СТАВ   | Electrospun | NaOH    | TEOS  |
|-----------------|-------|--------|-------------|---------|-------|
|                 |       |        | Hematite    |         |       |
| ESH@MS-60       | 177   | 0.0088 | 1           | 0.0032  | 0.071 |
| ESH@MS-40       | 177   | 0.0073 | 1           | 0.0032  | 0.023 |
| ESH@MS-20       | 52.7  | 0.0058 | 1           | 0.00094 | 0.021 |

**Table S1:** Molar ratios used in the syntheses of core shell nanofibers.



Figure S1. TEM images of reactions done at a) pH 10 b) pH 12 showing free silica formation



**Figure S2.** Histogram plots of A) ESH, B) ESH@MS-20, C) ESH@MS-40 and D) ESH@MS-



**Figure S3.** Nitrogen adsorption-desorption isotherm plot and pore size distribution (inset) for ESH@MS-40



Figure S4. Thermogravimetric analysis of ESH@MS-60-NH<sub>2</sub> sample



Figure S5: FTIR spectra of Hematite, ESH@MS-20, ESH@MS-40 and ESH@MS-60 and ESH@MS-60-NH<sub>2</sub> samples.



Figure S6. Solid state  ${}^{13}$ C NMR spectrum showing the amine functionalization on ESH@MS-60-NH<sub>2</sub>



Figure S7: STEM bright field images and EDS spectra of Cr(III) adsorbed on ESH at pH=5.4



Figure S8: HRTEM bright field images and EDS spectra of Cr(III) adsorbed on ESH@MS-60-NH<sub>2</sub> at pH=5.4



Figure S9: HRTEM bright field images and EDS spectra of Cu(II) adsorbed on ESH@MS-60-NH<sub>2</sub> at pH=4