Electronic Supplementary Information (ESI) for

## Effect of nonreactive kaolinite on 4-

## chloronitrobenzene reduction by Fe(II) in goethite-

## kaolinite heterogeneous suspensions

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Summary: 4 pages, 4 figures

<ul> <li>Figure S1. Reduction of 4-CINB by Fe(II) or kaolinite alone</li> <li>Figure S2. Reduction kinetics of 4-CINB by Fe(II)/goethite with kaolinite filtrates</li> <li>Figure S3. Cryo-TEM images of kaolinite with beam damage</li> <li>Figure S4. Magnetic characterization of post-reaction solids</li> </ul>	
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**Figure S1**: Reduction of 4-ClNB in reactors containing Fe(II) and no particles or Fe(II) and 0.325 g/L kaolinite, demonstrating undetectable reaction and minimal adsorption of 4-ClNB on kaolinite.



**Figure S2**: Reduction of 4-CINB in reactors containing 0.325 g/L goethite with varying kaolinite loadings: no kaolinite (squares), 2 g/L kaolinite particles (triangles) and kaolinite suspension filtrates that have the equivalent 2 g/L volume of kaolinite stock solution freshly prepared (circles) or after 7 days of equilibration (diamonds).



**Figure S3**: Cryo-TEM images of two goethite-kaolinite aggregates in suspensions containing 0.325 g/L Gth and 2 g/L Kln. Images taken before (a,c) and after (b,d) 1 min of electron beam exposure, demonstrating that the hexagonal shaped particles are kaolinite as opposed to ice or other artifacts of cryo-imaging.



**Figure S4**: Low-temperature magnetic characterization of post-reaction solids from 0.325 g/L goethite and either 0.05 or 2 g/L kaolinite in 10 mM bicarbonate buffer at pH 7 with [Fe(II)]i = 1 mM after five spikes of 4-ClNB. FC = field cooled. ZFC = zero-field cooled. Magnetization normalized to the maximum of the FC curve for each sample. Both samples demonstrated magnetic properties characteristic of only goethite.