UNDERSTANDING THE IMPACTS OF SODIUM SILICATE ON WATER QUALITY AND IRON OXIDE PARTICLES

ELECTRONIC SUPPLEMENTARY INFORMATION

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Figure S1. Final (a) pH and (b) residual Fe (II) after 3.5 hour of reaction.
Figure S2. Effect of sodium silicate on the formation of iron particle suspension (a) colour and (b) turbidity in NaHCO₃ buffered synthetic water at 21±1°C.
Figure S3. Scanning electron microscopy-energy dispersive X-ray spectrosopies (SEM-EDS) of (a) control system (Fe); (b) system in the presence of sodium silicate (60 mg/L) (Fe-Si); (c) system in the presence of DOM (3 mg TOC/L) and chlorine (2.5 mg/L) (Fe-DOM-Cl$_2$); and (d) system in the presence of DOM (3 mg TOC/L), chlorine (2.5 mg/L) and sodium silicate (60 mg/L) (Fe-DOM-Cl$_2$-Si).
Figure S4. X-ray powder diffraction (XRD) of (a) control system (Fe); (b) system in the presence of sodium silicate (60 mg/L) (Fe-Si) and (c) XRD standard curves.
39 Characteristics of Goethite and Magnetite

40 Goethite (FeOOH):

41 Particle size distribution in the range of 0.314-7.64 µm (>1%) using laser diffraction

42 Surface area 10.97 m²/g using BET-N₂

43 Magnetite (Fe₃O₄):

44 Particle size distribution in the range of 0.991-35.3 µm (>1%) using laser diffraction

45 Surface area 6.77 m²/g using BET-N₂

46
Figure S5. Molecular weight distribution of residual DOM at sodium silicate dosages of 0-90 mg/L with (a) goethite and (b) magnetite using high performance size exclusion chromatography (SEC-HPLC).
Figure S6. Weight-average molecular weight of matter in the presence of 0.3 g/L of goethite or magnetite. Data summarized from high performance size exclusion chromatogram results.
Figure S7. Effect of sodium silicate (20 mg/L) on the Zeta ($\zeta$-) potential of (a) goethite (0.3 mg/L) and (b) magnetite (0.3 mg/L) at pH 6.5 and 21±1°C in a 0.01M NaCl solution.