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Version: Supplemental Material

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4   **Sensitivity Analysis of the Cu Ferrihydrite, Goethite and Humic Acid Surface Complexation**

5   **Models**

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7   To evaluate the sensitivity of our end-member models to our chosen input parameters (Section 3.3.1,

8   main article) we performed a sensitivity analysis where, for each model, we systematically varied

9   C_{stern}, electrolyte binding constants, surface site densities and surface area, while monitoring the log K

10   for the Cu adsorption complex. The analysis for Fh is reproduced here from Moon and Peacock

11   (2013). The analyses for Gt and HA are done here based on the protocols of Moon and Peacock

12   (2013). In keeping with the Fh analysis, we varied C_{stern} by ±40%, electrolyte binding constants

13   between -1.5 and 0.5 log K, and the surface site densities and surface area by a factor of ±3. The Gt

14   analysis was performed using the combined Gt_0.2wt%Cu and Gt_0.7wt%Cu input file. The results of

15   our analysis indicate that our models are able to provide equally good fits to our Cu adsorption data

16   under all combinations of input parameters at the extremes listed above. The optimised best fitting log

17   K values for Fh, Gt and HA varied by up to ±0.9, ±0.7 and ±1.0 log units, respectively, depending on

18   the combination of model input parameters used. Our models are therefore robust under all reasonable

19   model input parameters and we find log K values for Fh, Gt and HA of 8.61±0.9 (Moon and Peacock,

20   2013), 12.93±0.7 and 2.42±1.0, respectively.