**Ref 7215**

**Title:** **Arsenic removal from water using a one-pot synthesized low cost mesoporous Fe-Mn modified biosorbent**

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Dear Editors, thank you for the opportunity to revise our manuscript. Please find our responses (in italics after the reviewers comments) to the reviewer specific comments below. We would like to thank the reviewers for the time they invested in improving our manuscript.

All changes we have made to the manuscript have been highlighted in yellow. Note that the page and line numbers used are those from the pdf version of this manuscript.

**Reviewer #1:**

**Specific comments:**

1. Page 3, Ln 75: As2O3 and As2O5 Producer?

*The producer of As2O3 and As2O5 now indicated in the manuscript.*

1. Page 3, Ln84: Suspension was washed?

*Correct. The suspension was filtered, washed several times with fresh ultra-pure water to neutral pH and dried at 110°C for 4 h. The dried sorbent was crushed and stored in a desiccator before use.*

1. Page 5, Ln 157: The XRD pattern of chitosan shows typical crystalline diffraction peaks at 19.923. Do you mean 2θ = 19.9 °?

*Correct. Clarified in the text.*

1. Page 6, Ln 159: Fe-Mn oxide particles are more stable in amorphous form? Reference to support this statement?

*Two references have been added to support this statement that Fe-Mn oxide particles are more stable in an amorphous form.15,16*

1. Figures for the isotherm experiments?

*We added Figure 3. which show Freundlich sorption isotherms for sorption of As(III) and As(V) on Chit and Chit-FeMn.*

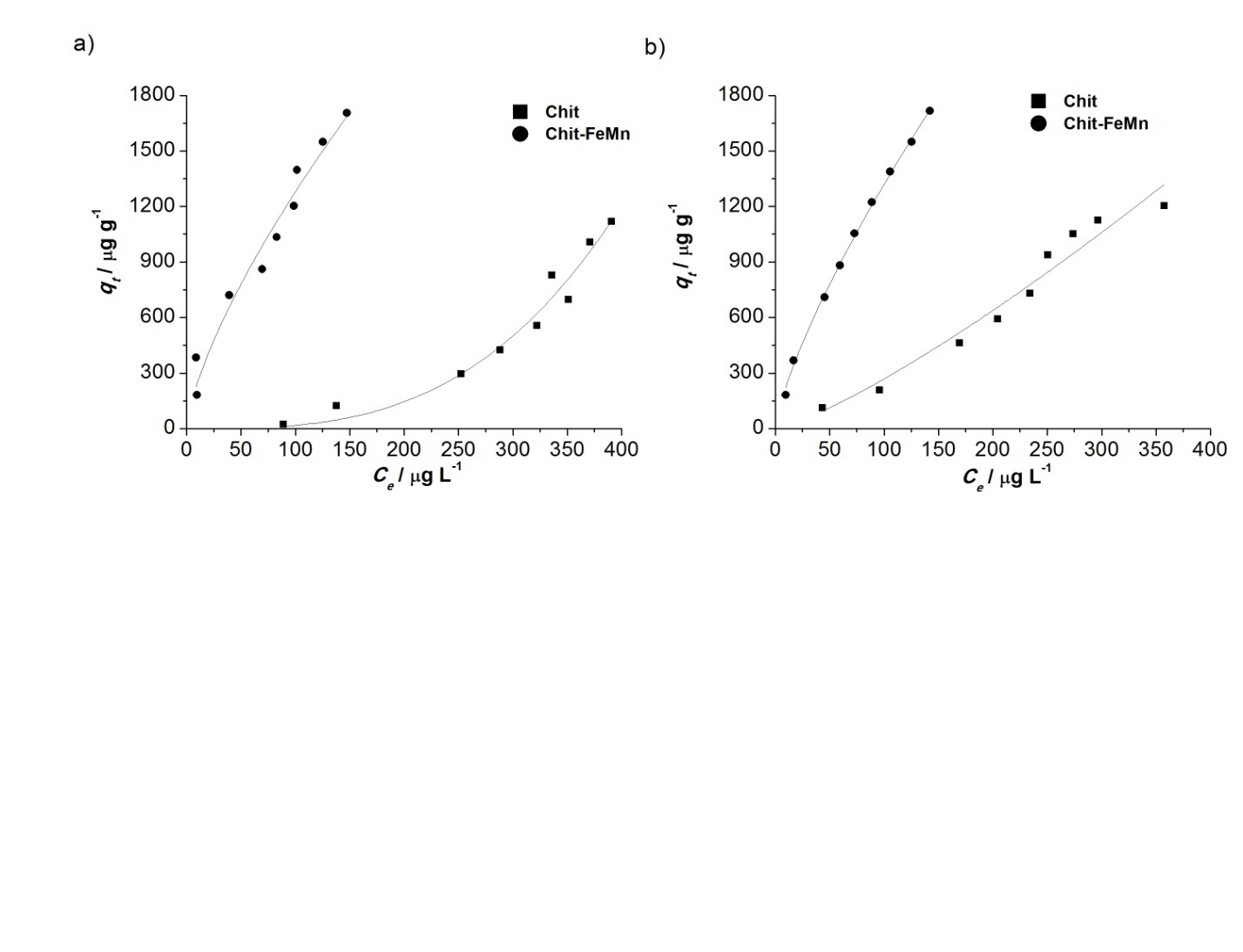


Figure 3. Freundlich sorption isotherms for a) As(III) and b) As(V) adsorption onChit and

Chit-FeMn. Initial As concentration 0.1-1 mg L-1, sorbent dose 0.5 g L-1, pH = 7.0±0.2

1. Page 12 Ln 309: Without error bars we cannot critically assess data for figures. Is uptake of As(III) statistically different than As(V)?

*The difference between the two forms of arsenic is not statistically significant. The discussion relating to pH has been rewritten to better reflect the similarity between the behaviours of As(III) and As(V).*

1. Page 11, Ln 279, 280, Page 12, Ln 310. Various comments relating to proof inner sphere complexes on amorphous metal oxides and ligand exchange.

*We have modified our discussion of the adsorption mechanisms in the manuscript in a number of places, taking on board the suggestions and comments of the reviewer. In particular, we have made a more detailed comparison of our results with the available literature. We would like to thank the reviewer again for their comments, as we believe our discussion section is now much improved. In terms of specific changes to the manuscript, the following literature results are given as evidence supporting the formation of inner sphere complexes via ligand exchange: Goldberg and Johnston 41 reported that As(V) forms inner sphere complexes with Fe oxides, and that As(III) can form both inner and outer sphere complexes. The leaching of Mn from our sorbent during adsorption of As(III) confirm the oxidation of As(III) prior to adsorption, as also reported by Ocinski et al.33 and Zhang et al.34 Finally, our results for the pH dependence and the impact of ionic strength (nitrates investigated as competitive anions) show little variation, which is also suggestive of inner sphere complexes, according to Goldberg and Johnston41 and Maliyekkal et al.42 Finally, Kong et al. 43 investigated the adsorption of arsenic on a similar sorbent, nanoscale Fe-Mn binary oxides loaded on zeolite, and also proposed a ligand exhange mechanism forming inner-sphere comlexes for both As(III) and As(V).*

*Please see the final paragraph of the FTIR analysis discussion for these modifications.*

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