

# Supplementary material

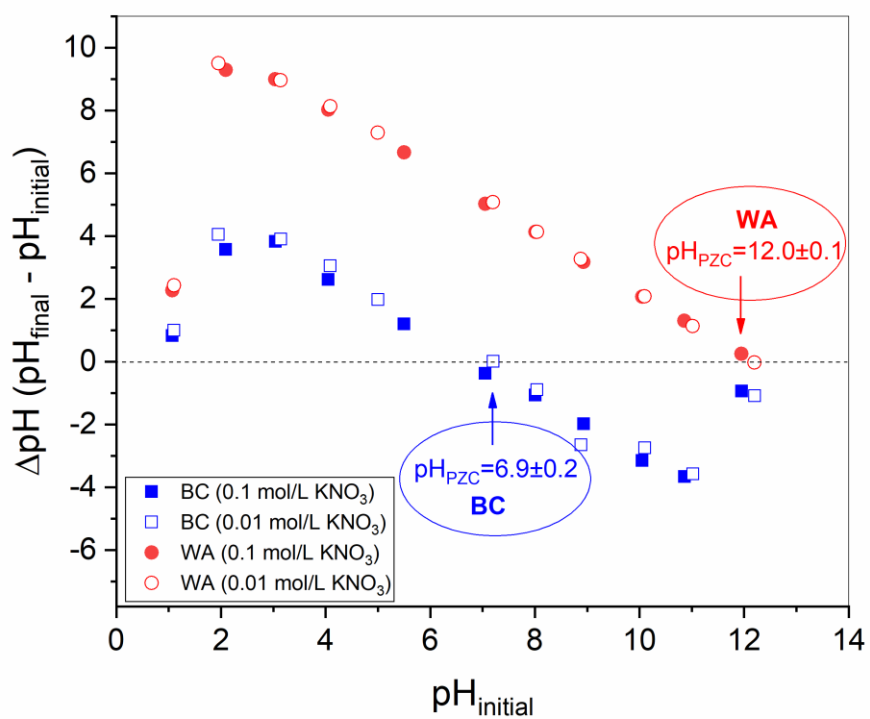
## **Performance Assessment of Wood Ash and Bone Char for Manganese Treatment in Acid Mine Drainage**

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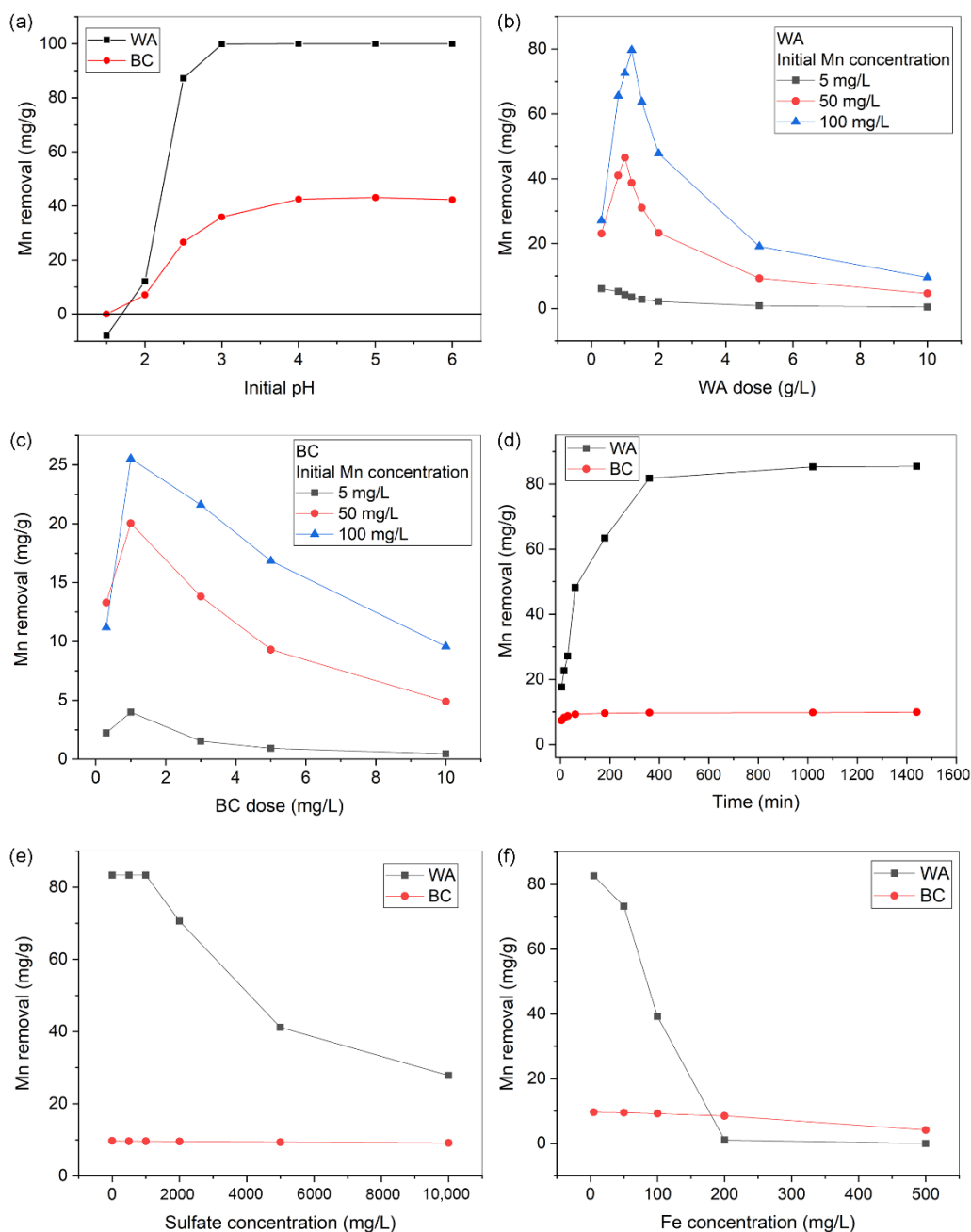
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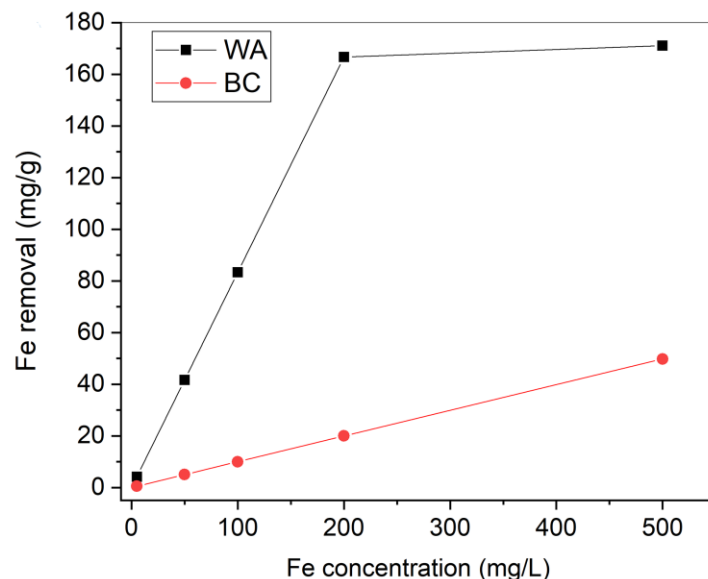
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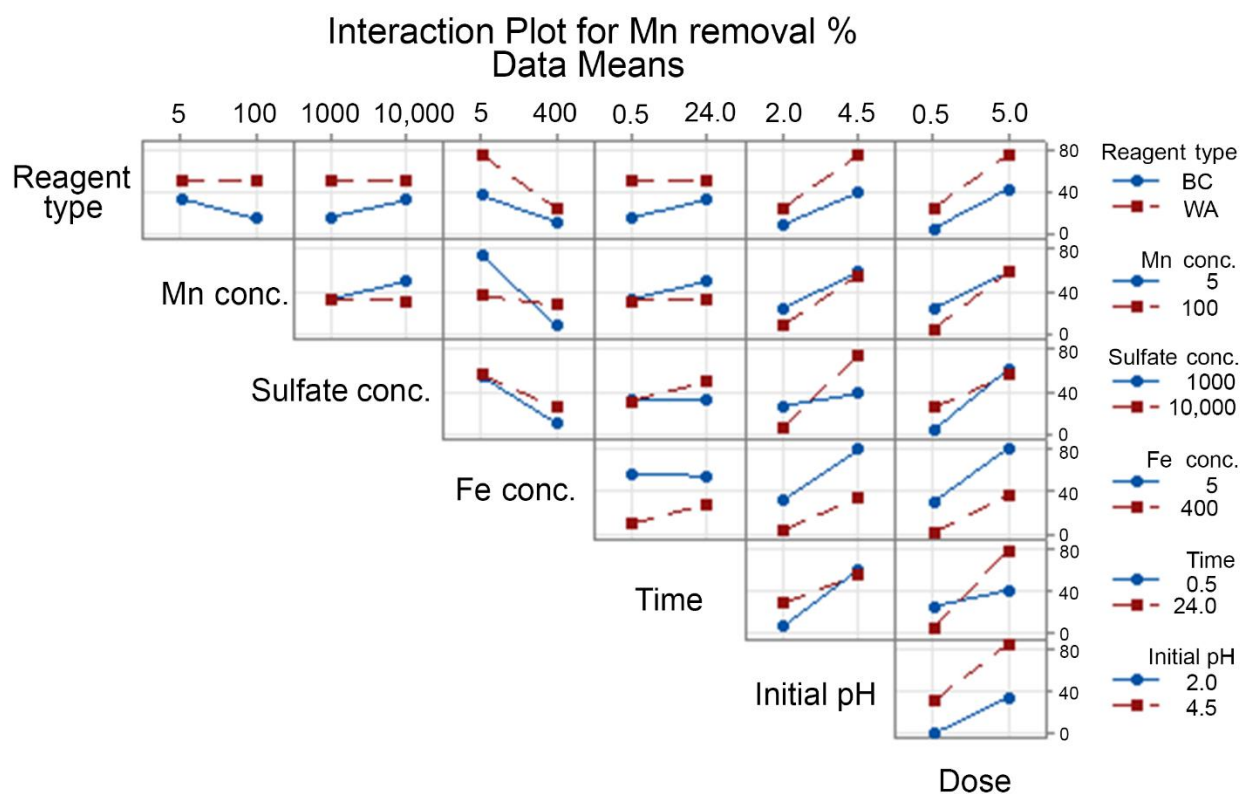
**Figure S1.** Determination of the point of zero charge ( $\text{pH}_{\text{PZC}}$ ) of the BC and WA samples.



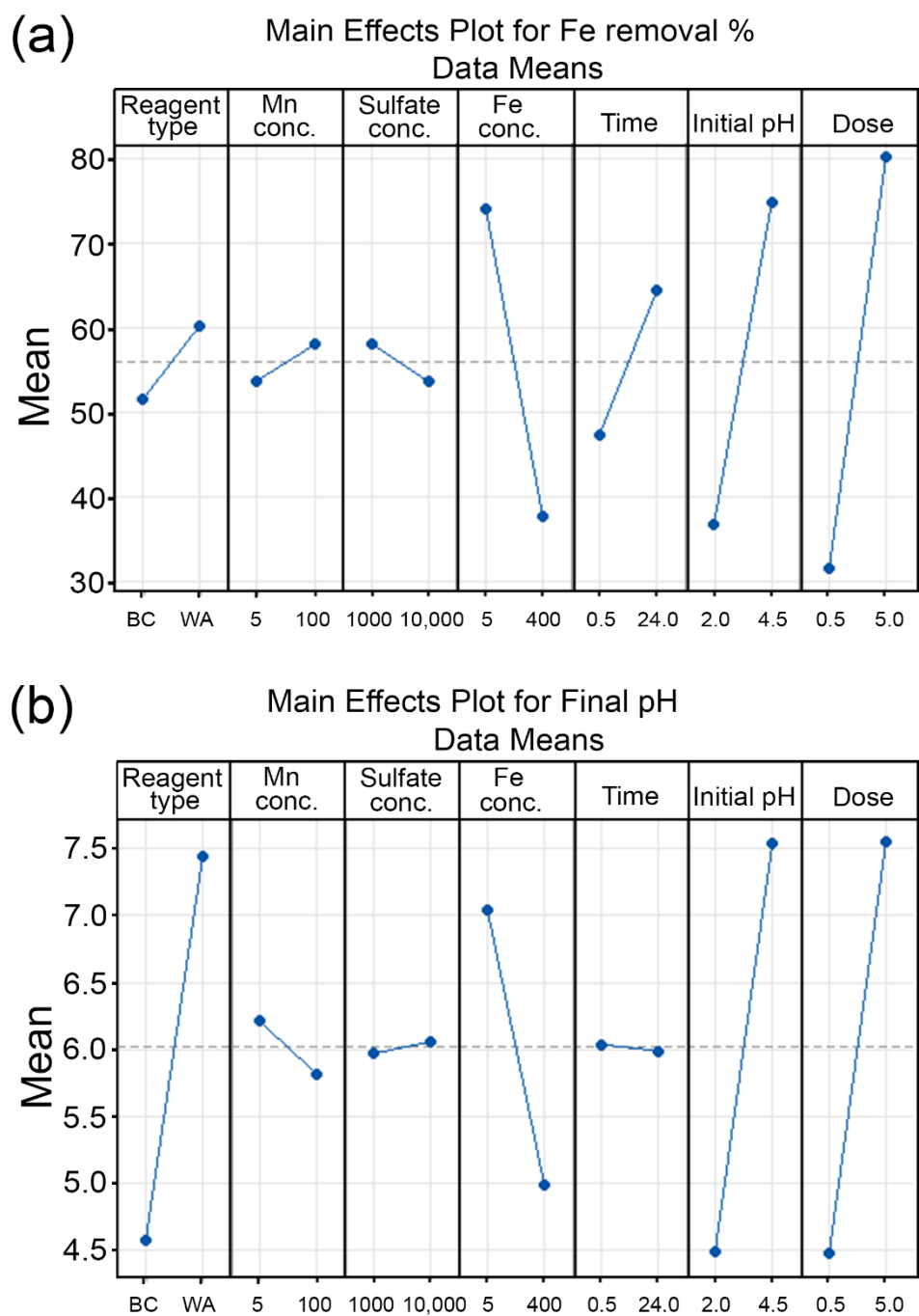
**Figure S2.** The amounts of Mn removed per unit mass of reagent (mg/g) as affected by (a) initial pH (dose 1 g/L, initial Mn concentration 100 mg/L, contact time 24 h), (b) WA dose and Mn concentration (initial pH 2.5, contact time 24 h), (c) BC dose and Mn concentration (initial pH 2.5, contact time 24 h), (d) contact time (initial Mn concentration 100 mg/L, dose 1.2 g/L WA and 10 g/L BC, initial pH 2.5), (e) sulfate concentration (initial Mn concentration 100 mg/L, dose 1.2 g/L WA and 10 g/L BC, initial pH 2.5, contact time 24 h), (f) Fe concentration (initial Mn concentration 100 mg/L, dose 1.2 g/L WA and 10 g/L BC, initial pH 2.5, contact time 24 h).



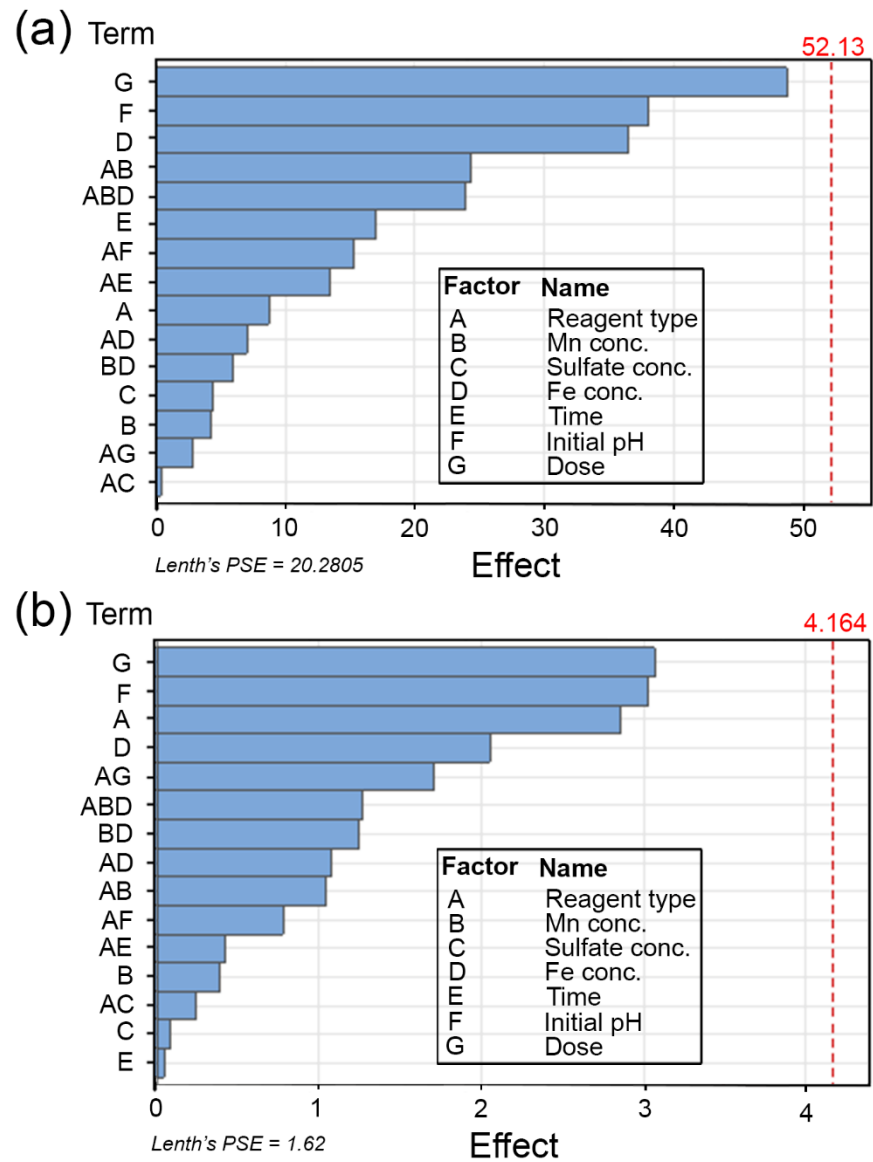
**Figure S3.** The amounts of Fe removed per unit mass of reagent (mg/g) as affected by the concentration of Fe. Initial Mn concentration 100 mg/L, dose 1.2 g/L WA and 10 g/L BC, initial pH 2.5, contact time 24 h.



**Figure S4.** Interaction plot for Mn removal.



**Figure S5.** Main effect plots for (a) Fe removal, and (b) final pH.



**Figure S6.** Pareto chart of the effects of variables on (a) Fe removal, and (b) final pH.