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Drinking Water
Engineering and Science
Discussions

Interactive comment on "Adsorption and Desorption studies of *Delonix regiapods* and leaves: Removal and recovery of Ni(II) and Cu(II) ions from aqueous solution" *by* Bolanle M. Babalola et al.

Anonymous Referee #1

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Adsorption and desorption studies of Delonix regia pods and leaves: removal and recovery of Ni(II) and Cu(II) ions from aqueous solution. The removal of Ni and Cu was studied by adsorption of specific agro-waste. It is an interesting study, but the paper should be modified and the written quality of the paper should be improved, and apart from the given suggestions of the reviewer, be checked by a native speaker. General comments: - A clear objective (and knowledge gap) at the end of the introduction is still missing or weak. How does this relate to previous research in the area? The "therefore" in line 99 is not well underpinned/ - Language, including tenses, is of poor

quality. - Redundant information should be deleted. - The discussion of the results is weak. How do the results link to other research? How are the results (including isotherm constants and kinetic constants) relate to other adsorbents? - The order of the presented results should be reconsidered. Better to start with the kinetic tests and equilibrium tests and then relate that to change in pH and structure of the pods and leaves. Specific comments: - Line 15: include stating that it were "batch tests" - Line 17-18: it is not relevant in the abstract if data fit a model. More important is how well the metals adsorb in relation to other adsorbents. - Line 20: "concentrations". However, it is not clear from the data if nitric acid is effective. - Line 21-22: delete sentence, since a good economic study is not made - Line 38: delete "of heavy metals" - Line 39: delete "and cause serious pollution" - Line 40-42; delete sentence - Line 43: supply = resources - Line 44: add "production" (of glass, textiles, paper etc.) - Line 45: delete "apart from.. ecosystem" - Line 46: insert "human" (gills, liver. . ..) - Line 48"" during = in the; of animal = in animals - Line 52: add "also" (reported) - Line 53: delete "Like most heavy metals"; its = a - Line 54, add "," after "health" - Line 55 add "," after "compounds" and after "nickel" - -line 58-61: too simple, many processes are effective and thus not "inadequate". So refer better to other research. Byt the way: reverse osmosis is a membrane process. . . - Line 64, adee "," after "value" - Line 66: "shells, " - Line 67: "shells" - Line 68: "treat" = "remove"; indicate effectiveness of the shell as well - Line 69: what was the "treatment" of the materials like? - Line 71: insert "," after "biomass"; "optimum conditions" = "dosage" - Line 73: delete "adsorbent dosage of"; insert "at" before pH: stirring speed is not relevant - Line 75-78: delete sentence - Line 83: "seeds" - Line 84, delete "the treatment . . .. To"; "reduce" = "reducing" - Line 88-90: delete sentence - Line 96-98: delete sentence - Line 99-: give knowledge gap, based on the previous research and explain reason to study selected material better. - Line 106-108: delete sentence (not relevant in the context of the research) - Lin 111: give concentrations of stock solutions - Line 118-121: give pHs to be studied: give concentrations that are studied - Line 129: "use" = "used" - Line 130-131: "is" = "was" (three times) - Line 132: "are" = "were"; do not indicate only average but also the

ranges - Line 129-137: explain procedure of the batch tests in detail (number of jars, concentrations, dosages); further explain the modelling part in the M&M section too. - Line 141: “structures, being potentially beneficial for the uptake” - Line 143-144: “is” = “was” (two times) - Line 144-145: what do these data indicate? Give discussion with literature - Line 156: how can we find the value in the Figure? - Line 158-159: why the authors have this opinion? Can they support this with literature? - Line 166: explain in M&M what were dosages and how it was known that equilibrium was reached, (may be start with kinetic tests.). - Line 167: “reveals”; do not use “significant” without statistical analyses.. - Line 168: “adsorbents”; delete “very” (subjective); “increased”. - Line 169: delete sentence - Line 170: “is” = “was’; delete “as the optimum pH and used” - Line 173: add “, thus being in line with our findings” and explain why. - Line 175 (and further): do not connect data points with lines in figures (no meaning) - Line 180: delete “for Cu(II) ions”; “pH 4 was used . . . pods while pH 5 was” = “which were further”. - Line 181: “leaves and pods, respectively” - Line 182-184: discuss with literature what happened. - Line 184: delete “Thus. . . studies”; “literatures” = “authors” - Line 187: delete “Generally. . .. Media”. - Line 188: give reference - Line 189-191: delet “”when. . .... particles” - Line 192: add “the positive metal ions”; “decreases” - Line 194: delete “This will. . . adsorbent” - Line 201: “for” = “of” - Line 203: see comment of line 175 - Line 209: “interacting” = “interaction with” - Line 212: “adsorbents” - Line 213: “to” = “until” - Line 217: explain better how the work of Hansen supports the data - Line 221: “is a. . . fact” = “indicates”; give reference for this statement - Line 223-226: should be in Materials and methods section - Line 223: “is well” = “can be” - Line 225: delete “any” - Line 228: explain how the results relate to research on other adsorbents, so discuss with literature - Line 235: “decreased”; this statement is normal for isotherms, so please give references - Line 236-237: rephrase sentence - Line 246: “higher number” = “high concentration”; give also a reference for this statement - Line 248-249: delete sentence (normal behaviour) - Line 250:263: should be explained in Materials and methods section - Line 264- 267: the fact that the pods are better than the leaves is a result of the data and not of the isotherms. So better first discuss the

data and then the isotherms - Line 269: “The fit to the plot of the Langmuir isotherm suggests the possible monolayer. . .” - Line 271: delete “slight” - Line 272-274: delete sentence - Line 277: explain why the Langmuir isotherm does not fit well to the leaves data. Discuss this with literature. - Line 280: discuss the obtained data with data form literature on other adsorbents - Line 283: “The Freundlich isotherm is used to describe adsorptions onto..” - Line 288-293: part of Materials and methods secion - Line 295-299: see observation in Line 264-267. - Line 302-304: explain why this is with literature and how this relates to other research. How can it be that the pods fit to both Langmuir and Freundlich and the leaves only to Freundlich? Is can be a question of equilibrium concentration. - Line 305 and further: changing adsorbent dose does not give extra information over changing concentrations. These are both methods do determine the isotherms - Line 321: “shows” - Line 322: “biomasses” - Line 322-325: give references for this statement - Line 331: see comment on Line 175 - Line 335: “concentrations” - Line 336: “Was” = “were” - Line 337-339: what can be the reason? Discuss with literature - Line 340:342: discuss with literature - Line 344-346: the effect of higher concentrations are not clear, so this cannot be concluded - Line 348: “application” = “use” - Line 352-354: Explain the reason. - Line 355-356: see line 344-346 - Line 357-359: this cannot be concluded because a thorough economic analysis is not made.

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