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OPEN PEER REVIEW

Removal of Pyrocatechol from Aqueous Solution Using Activated Carbon Coated with Aluminum Nanoparticles by a Green Method

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About this report

This open peer review (OPR) report shows the public comments made on this article during peer review, by the reviewers, the associate editor and the editor-in-chief, for every revision round, together with the authors' replies. Comments appear only with the consent of the people who wrote them. Reviewers who chose to sign their report are named; the others are shown as "Referee". Comments are edited for language only, and confidential remarks to the editors are not included.

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1 Original submission

1 comment · 31 Jan 2024

Editor-in-Chief

MAJOR REVISION 31 Jan 2024

Dear Authors,
The manuscript needs Major revision.
Best,

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Revision 1

AUTHORS' RESPONSE TO REVIEWERS

Authors' reply to reviewers

The next pages contain the authors' point-by-point reply to the comments of this revision round, as submitted with the revised manuscript. It is published as the authors wrote it.

Responses to Reviewer's Comments

Dear editors and reviewers,

Thank you very much for giving us an opportunity to revise our manuscript. We appreciate the editor and reviewers genuinely for their constructive comments and suggestions. We believe that the quality of the revised manuscript has been significantly enhanced based on the constructive suggestions. We have highlighted the revised content in the revised manuscript. In this resubmitted version, we have made point-by-point responses to the comments.

If there are any questions regarding the revised manuscript, please feel free to let us know.

Thank you very much for your consideration.

Yours sincerely,

Reviewer 1:
The authors investigated the Investigating the Removal of Pyrocatechol from Aqueous Solution Using Activated Carbon derived from Oak Wood Coated with Aluminum Nanoparticles by
Green Method.

1. The authors designed the work in a systematic way by performing some valuable experimental works accordingly. It is also necessary to critically evaluate new data and do not make hasty conclusions which may lead to misinterpretations. However, several points are important to be addressed before going to possible publication in this high-quality journal. Also, the authors need to address all points in the revision stage for broad range readers understanding the introduction is not interesting. Note the innovation of the work and its differences from previous works.

Response: Thank you for your constructive comments, which are helpful in improving our study. We have revised the manuscript (Lines 62 to 81).

2. Add the tekmin isotherm to determine whether the process is endothermic or exothermic.

Response: Thank you for your constructive comments, which are helpful in improving our study. Determining the water isotherm was not one of the goals of this project.

3. Add the Dublin isotherm to determine the type of adsorption (physical or chemical).

Response: Thank you for your constructive comments, which are helpful in improving our study. Determining the water isotherm was not one of the goals of this project.

4. Bring the mechanism of the study according to the kinetics of interparticle diffusion.

Response: Thank you for your constructive comments, which are helpful in improving our study. We have revised the manuscript (Lines 25 to 27).

5. In the abstract section, it is necessary to discuss more about the results of equilibrium behavior. It is also necessary to mention the maximum absorption capacity.

Response: Thank you for your constructive comments, which are helpful in improving our study. We have revised the abstract section (Lines 23 to 31).

6. In the materials and methods section, it is necessary to mention the percentage of purity and the company producing the materials.

Response: Thank you for your constructive comments, which are helpful in improving our study. We have revised the materials and methods (Lines 86 to 89).

Reviewer 2:
Dear Editor
Thank you for entrusting me with the review of the article titled “Investigating the Removal of Pyrocatechol from Aqueous Solution Using Activated Carbon Derived from Oak Wood Coated with Aluminum Nanoparticles by Green Method”

Suggestions for improvement:
1. Provide more specific details about the experimental methods used, such as the preparation of activated carbon coated with aluminum nanoparticles

Response: Thank you for your constructive comments, which are helpful in improving our study. We have revised the manuscript (Lines 116 to 122).

2. Include specific numerical values or ranges for the results obtained, such as the percentage of removal efficiency at different conditions

Response: Thank you for your constructive comments, which are helpful in improving our study. We have revised the manuscript (Lines 225 to 225), (Lines 242 and 243), (Lines 264 to 269) and (Lines 284 to 287).

3. Mention any limitations or potential sources of error in the study

Response: Thank you for your constructive comments, which are helpful in improving our study. We have included limitations or potential sources of error in the study in the “Limitations” section (Lines 374 to 378).

4. Provide suggestions for future research or applications based on the findings.

Response: Thank you for your constructive comments, which are helpful in improving our study. We have revised the manuscript (Lines 369 to 372).

5. The conclusion paragraph of the article is very short, incomplete lacks information, and is not acceptable

Response: Thank you for your constructive comments, which are helpful in improving our study. We have revised the manuscript (Lines 356 to 372).

By incorporating these suggestions, the manuscript can be further improved to provide a more comprehensive overview of the research conducted.

Reviewer 3:
The authors investigated the efficiency of AC-Al2O3 to remove Pyrocatechol from polluted waters. In this study, the adsorbent was synthesized by the sol-gel method and its characteristics were reported. The results of the study are well presented and the article can be accepted after correcting all the following points.

1- It is suggested to change the title. The words "investigating" and "Derived from Oak Wood" should be deleted.

Response: Thank you for your constructive comments, which are helpful in improving our study. We have revised the title (Lines 1 and 2).

2- Pay attention to capital words in the title and text of the article.

Response: Thank you for your constructive comments, which are helpful in improving our study. We have revised the manuscript (Lines 4, 13, 83, 92, 103, 146, 182 and 279).

3- The section "abstract materials and methods" should be modified. For example, adding the synthesis method, determining the characteristics of the adsorbent, and then determining the optimal conditions for the adsorption process.

Response: Thank you for your constructive comments, which are helpful in improving our study. We have revised the manuscript. (Lines 13 to 22).

4- The language of the article should be improved in terms of native English.

Response: Thank you for your constructive comments, which are helpful in improving our study. We have revised the manuscript.

5- In the abstract conclusion section, the authors write that different activated carbon can be obtained from the raw material. Did you extract different activated carbons from oak wood?

Response: Thank you for your constructive comments, which are helpful in improving our study. We have revised the manuscript (Lines 28 to 31).

6- The study innovation is not well explained in the introduction.

Response: Thank you for your constructive comments, which are helpful in improving our study. We have revised the manuscript (Lines 62 to 81).

7- The purity of the materials should be added.

Response: Thank you for your constructive comments, which are helpful in improving our study. We have revised the manuscript (Lines 86 to 89).

8- Schematic of adsorbent synthesis method should be added.

Response: Thank you for your constructive comments, which are helpful in improving our study. We have revised the manuscript (Figure 1 in lines 155 and 156).

9- Primary adsorbent synthesized based on screening, PAC or GAC?

Response: Thank you for your constructive comments, which are helpful in improving our study. The primary adsorbent synthesized was PAC.

10- Section 2.3: graphene oxide solution????

Response: Thank you for your constructive comments, which are helpful in improving our study. We meant the solution made of graphene oxide and we have revised the manuscript (Lines 104 and 105).

11- It is suggested to put °C instead of degrees Celsius.

Response: Thank you for your constructive comments, which are helpful in improving our study. We have revised the manuscript (Lines 90, 95, 97, 100, 102, 105, 107, 108, 110, 112, 105, 121, 122, 139 and 225).

12- answer???

Response: Thank you for your constructive comments, which are helpful in improving our study. We have revised the manuscript.

13- Tris??? (what word is the abbreviation)

Response: Thank you for your constructive comments, which are helpful in improving our study. We revised the full Tris buffer name in the manuscript (Lines 88).

14- Was your adsorbent PAC or AC-Al_2O3??? (to be corrected in the materials and methods section)

Response: Thank you for your constructive comments, which are helpful in improving our study. We have revised the manuscript (Lines 116 to 122).

15- The characterizations of diagnostic analysis devices (XRD, FTIR and FESEM) should be added.

Response: Thank you for your constructive comments, which are helpful in improving our study. We have revised the manuscript (Lines 147 to 152).

16- The effect of temperature and thermodynamics (equations, evaluated temperature range) should be well explained in the material and methods method.

Response: Thank you for your constructive comments, which are helpful in improving our study. We deleted this section.

17- The Data analysis section should be deleted.

Response: Thank you for your constructive comments, which are helpful in improving our study. We deleted Data analysis section.

18- The adsorbent properties section should be explained in more detail.

Response: Thank you for your constructive comments, which are helpful in improving our study. We have revised the manuscript (Lines 190 to 192), (Lines 199 to 203) and (Lines 215 to 217).

19- BET analysis was not mentioned in the work method. Meanwhile, the authors brought its results in Table 1.

Response: Thank you for your constructive comments, which are helpful in improving our study. We have revised the manuscript (Lines 138 to 144).

20- 0.000035????

Response: Thank you for your constructive comments, which are helpful in improving our study. This number is obtained according to equation 5 and it can be considered almost zero and it can be said that pyrocatechol has no ionization power in pH=3.

21- Add more studies for the effect of parameters.

Response: Thank you for your constructive comments, which are helpful in improving our study. We have revised the manuscript (Lines 232 to 234), (Lines 253 to 259) and (Lines 275 to 277).

22- By fitting the data with second order kinetics and Freundlich isotherm, the authors add the type of pollutant adsorption mechanism by the synthesized adsorbent. Finally, it is suggested to add the schematic of the adsorption possible mechanism.

Response: Thank you for your constructive comments, which are helpful in improving our study. We have revised the manuscript (Lines 297 to 344).

23- The isotherm section should be reported in more detail. The type of isotherms used, their equations, results, interpretation and also reference.

Response: Thank you for your constructive comments, which are helpful in improving our study. We have revised the manuscript (Lines 315 to 344).

24- Which salt did you use as an ionic strength factor? please add.

Response: Thank you for your constructive comments, which are helpful in improving our study. Salt NaCl was used as the ionic strength factor and the manuscript was revised (Lines 245).

25- The discussion section must be written again.

Response: Thank you for your constructive comments, which are helpful in improving our study. We have revised the manuscript (Lines 190 to 192), (Lines 199 to 203), (Lines 215 to 217), (Lines 225 to 228), (Lines 232 to 234), (Lines 242 to 247), (Lines 253 to 259), (Lines 264 to 273), (Lines 275 to 277), (Lines 282 to 287), (Lines 299) and (Lines 316 to 344).

26- The article should be written based on the authors' guide, because there are many grammatical and writing errors in the text.

Response: Thank you for your constructive comments, which are helpful in improving our study. We have revised the manuscript.

2 Revision 1

3 comments · 22 Feb 2024 – 24 Feb 2024

Referee 1 Reviewer

ACCEPT 22 Feb 2024

I believe that the authors have addressed the concerns of the reviewers and the manuscript can be accepted for publication.

Associate Editor

ACCEPT 22 Feb 2024

I believe that the authors have addressed the concerns of the reviewers and the manuscript can be accepted for publication.

Editor-in-Chief

ACCEPT 24 Feb 2024

Dear Authors,
According to the reviewers' comments, the manuscript is acceptable for publication in this journal. The decision is accept.
Best,