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Peer Review Reports

Synthesis and characterization of $Fe_3O_4/SiO_2/C$ nanocomposites and their potential for NH_4^+ ion removal from shrimp farm wastewater

The article went through 2 rounds of review and in round 1, both reviewers agreed to publish their reviews anonymously, and in round 2, only Reviewer B agreed to publish their review The authors agreed to disclose the reviewers' reports and their responses to the reviewers' comments.

Disclaimer: The peer review report content is the entire copy of the reviewers' and authors' comments. Typing and punctuation errors are not edited.

ROUND 1

Reviewer A: Anonymous
Recommendation: Revisions Required

Excellent work! It presents a high degree of sustainability, as $Fe_3O_4/SiO_2/C$ nanocomposites were successfully synthesized, and carbon was efficiently extracted from mangrove leaf biochar. SiO_2 was also successfully extracted from silica sand. The techniques used and the results obtained are complementary and very well interpreted. There are minor adjustments to be made to the work.

In the introduction, in the last paragraph (copied below), the authors mention the techniques used to characterize the systems, but the text does not highlight any significant results. It is suggested to modify the last paragraph by emphasizing the main results that support the research's advancements.

In this research, the effect of carbon on the characteristics of Fe3O4/SiO2/C nanocomposites was also observed. Characterization of carbon, Fe3O4 nanoparticles, and Fe3O4/SiO2/C nanocomposites using Fourier transform infrared (FT-IR) to identify functional groups, detailed information about the crystallographic structure used X-Ray diffraction analysis (XRD), measurement of the magnetization used Vibrating-sample magnetometry (VSM) methods, Scanning Electron Microscopy dan Energy Dispersive X-ray (SEM-EDX) to measure particle diameter, morphology, and elemental content, and (TGA-DTA) to analyze weight changes, thermal stability, and other thermal characteristics. NH4+ adsorption was carried out in various variations including variations in the amount of adsorbent, contact time, temperature, and variations in concentration standard solution to find the kinetics, thermodynamic, and isotherm of NH4+ adsorption by Fe3O4/SiO2/C nanocomposites. The ammonia concentration was determined using the UV-Vis spectrometric method, referring to the phenate method and analysis of mapping levels using ArcGIS software……
The authors mention:
The carbon was soaked in 2% NaOH for 24 h, then filtered and washed with distilled water until the carbon reached a neutral pH.
It is suggested to modify this to:
until the filtrate solution reached a neutral pH.
The authors also mention:
The measurement results of the particle size distribution of Fe3O4 nanoparticles (Fig.5 a) indicate that the particles exhibit mesoporous sizes ranging from 2 to 50 nm, with an average diameter of 26.4 nm, classifying them as nanomaterials (1-100 nm).
However, figure 5a only shows SEM images with low resolution, making it impossible to determine mesoporous characteristics without complementary characterizations.
The authors write the following sentence:

Exothermic peaks indicate the thermal degradation of lignin, hemicellulose, and cellulose between 268-400 °C ((Vu et al., 2018)
However, it is not clear from the text whether the cellulose and lignin in question are residues from the process of obtaining the biochar.

Reviewer B: Anonymous
Recommendation: Revisions Required

The article is well-written and presents an important topic. The article has the potential to be published after a few corrections.
Some suggestions are described below:
1. The photograph in figure 1 could have been taken from another angle to highlight the magnet and the nanoparticles.
2. page 4, Results and discussion - Fe3O4 nanoparticles are ferrimagnetic and not ferromagnetic, please correct this information in the text. (doi: 10.3390/molecules29174160.)
3. The expected value of Magnetic moment is 90 (doi:10.1016/j.jmmm.2011.08.035) - The result obtained was around 60emu/g. Possibly, the authors obtained a mixture of iron oxide phases and not just magnetite. To check this, the authors could carry out a Rietveld refinement of the XRD data for the Fe3O4 nanoparticles and analyze the lattice parameter.

ANSWERS TO ROUND 1

Author's Files

ROUND 2

Reviewer A: Anonymous
Recommendation: Accept Submission

Reviewer A chose not to share his or her opinion, so only the final decision will be disclosed.

Reviewer B: Anonymous
Recommendation: Accept Submission

The authors made corrections and suggestions from the reviewers. In this way, the article has the potential to be published

ACCEPT SUBMISSION

October. 04, 2025