Review of: "Synthesis of Nickel Nanoparticles Using Ionic Liquid-Based Extract from Amaranthus viridis and Their Antibacterial Activity"

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Potential competing interests: No potential competing interests to declare.

Manuscript Title: Synthesis of Nickel Nanoparticles Using Ionic Liquid-Based Extract from Amaranthus viridis and Their Antibacterial Activity

Comments to the Author:

In this paper, the authors have synthesised nickel nanoparticles using Amaranthus viridis plant extract. Besides this, the authors have tried to exhibit the antibacterial activity of these synthesised nanoparticles.

1. The abstract should start with a more effective and precise sentence. In the abstract section, the aim of this study and the conclusion weren't mentioned. The aim of any study or work should be mentioned clearly in the abstract. In addition, the authors should provide a brief conclusion in this section.
2. In the Introduction section, authors should cite some more similar recent works like “Kiran, Ayesha, Shabbir Hussain, Israr Ahmad, Muhammad Imran, Muhammad Saqib, Bushra Parveen, Khurram Shahzad Munawar et al. "Green Synthesis of NiO and NiO@ Graphene Oxide Nanomaterials using Elettaria cardamomum Leaves: Structural and Electrochemical Studies." Heliyon (2024), Mandal, Biplab Kumar, Rahul Mandal, Suranjan Sikdar, Sidananda Sarma, Ananthakrishnan Srinivasan, Subhajit Roy Chowdhury, Bhaskar Das, and Rahul Das. "Green synthesis of NiO nanoparticle using Punica granatum peel extract and its characterization for methyl orange degradation." Materials Today Communications 34 (2023): 105302.”
3. Explain the advantages and disadvantages of using Amaranthus viridus plant extract for the synthesis of NiO nanoparticles.
4. Could authors please address the chemical compounds in Amaranthus viridus plant extract that actively participate during the NiO nanoparticle formation and provide a reaction mechanism of nanoparticle formation? [https://doi.org/10.3390/cryst12020146]
5. In the preparation of NiO nanoparticles, what is the synthesis efficiency? The authors should provide the respective values.
6. What are the concentrations and ratio between the chemicals and Amaranthus viridus plant extract? Under what clue

or experience did the author choose the ratios in the experimental section? Can the author elaborate on how the adding process was conducted, whether it was drop-adding or one-time adding, since the reduction process would dramatically influence the particle size?

7. Authors should rewrite the section “3.1. UV-Vis analysis of Ni NPs”. For the band gap determination, authors should consider the concept of the Urbach tail as well as the Kubelka–Munk function. [https://doi.org/10.1088/1402-4896/ad629f]
8. I think this paper would be more active if authors properly analyzed the FTIR results and compared these results with a detailed explanation of all peaks of FTIR of Amaranthus viridus plant extract. [https://doi.org/10.1016/j.cplett.2022.139699].
9. Why didn't authors use the Williamson Hall (WH) method for crystalline size measurements? For this purpose, authors can get some ideas from the following article https://doi.org/10.1088/1402-4896/ace857.
10. The SEM image is not clear. SEM micrographs with higher magnification, as well as a statistical size distribution along with the standard deviation, should be included in order to observe the morphology described in the text.
11. In the EDX results, authors must explain all peaks. [https://doi.org/10.1016/j.heliyon.2023.e20824, https://doi.org/10.1016/j.mtcomm.2022.105302].
12. The authors should either replace the picture in Fig. 7 or improve the resolution of the picture since it failed to show the difference between the 10%, 20%, and 30% zones of inhibition for Aeromonas hydrophilia, Escherichia coli, and Staphylococcus aureus. [https://doi.org/10.1016/j.cplett.2022.139699]
13. In the results section, authors should compare their results with the literature.
14. It would be beneficial if the authors carefully reviewed the paper for technical mistakes that sometimes occur.