

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.

Review Report

The manuscript is about the synthesis of Ni nanoparticles in the presence of plant extract and their characterization. The paper contains interesting results, but it is necessary to refine it and comment on the results in more detail. Also, based on the results, it is not possible to compare the characteristics of the Ni nanomaterial obtained in the presence of the plant extract with the characteristics of the material obtained without the extract. The manuscript needs major revision. I recommend this paper for publication after amending the given comments and suggestions.

The comments are given below:

1. In the first sentence of the Abstract, it was written that [C3MIM]Ac and microwave were used for extraction. In this way, it cannot be defined precisely whether you are using two different extraction techniques or their combination. I suggest that this part be written as "... [C3MIM]Ac in combination with microwave". Also, the main conclusions derived from this paper should be included in the abstract.
2. In the Introduction, the part related to ionic liquids is explained in detail, but there is very little information about Ni nanoparticles. The information about the purpose of applying extracts during the synthesis of Ni particles, what has been done on this topic so far, which extracts have been used so far, etc., has to be added. State what your contribution is in relation to the existing literature data.

The sentence "A novel extraction method based on microwave help has been developed to get over these constraints" didn't explain how to improve Ni nanoparticles production. Explain how the addition of extracts during the synthesis process affects the characteristics and quality of the obtained particles.

The introduction section has to be written with more up-to-date references.

1. Section 2.2. could be improved: 1. Method of preparation of ionic liquid, 2. Which volume of ionic liquid was used for extraction, 3. What type of filter did you use for filtration?
2. Section 2.4.: When you mention a term for the first time in the text, it is necessary to state the full name and enter the abbreviation; in the following text, the abbreviation is used. For example, *Escherichia coli* (*E. coli*). Microorganism species should be italicized.

3. All results obtained for Ni particles obtained in the presence of plant extract should be compared with the results for Ni particles without extract. Also, the FTIR spectrum of Ni particles obtained in the presence of the extract can be compared with the spectrum of the plant extract.
4. Section 3.1.: Explain Figure 1 and compare it with existing literature.
5. Section 3.2.: Two spectra are mentioned in the text (Ni particles before and after washing), but only one is shown in picture 2. It is necessary to compare the spectrum of Ni particles obtained in the presence of the extract with the spectrum of *Amaranthus Viridus* extract, and with the Ni particles obtained without the presence of the extract. It is necessary to assess whether some functional groups from the extract were incorporated into Ni nanoparticles.
6. Section 3.3.: Compare the results with XRD spectra of Ni particles.
7. Section 3.4.: You report three distinct mass losses and only comment on two. You should align the text.