OPEN PEER REVIEW

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- Authors' satisfactions from the review process: Increases honesty between authors and reviewers
- Education of both authors and new students
- Prevents reviewers from following their individual agendas and leading to the detection of reviewers' conflicts of interests

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Health Scope
Article DOI: 10.5812/jhealthscope.91419
Published in: Health Scope: 9(1); e91419

Peer Review Report for "Adsorption of La (III) on Chitosan-Imprinted Nano Zero-Valent Iron Nanocomposite (CS@nZVI): Process Optimization, Isotherm, Kinetic, and Thermodynamic Studies"

Author(s): Ahmadreza Yazdanbakhsh , Hassan Rasoulzadeh

Review Timeline:

Submit Date: 9 Mar 2019
Revised Date: 17 May 2019
Accepted Date: 2 Jun 2019

Revision (0)

Here, you can see the **Reviewers**, **Associate Editors** and **EICs'** comments from the beginning to the end of the revision process.

REFEREE: Reviewer | **Revision** (0)

3 May 2019

Dear Editor
My comments about the mentioned manuscript are as follows:
-The title of “Adsorption of La (III) on Chitosan-Imprinted Nano zero-valent Iron Nanocomposite (CS@nZVI): Process Optimization, Isotherm, Kinetic, and Thermodynamic studies” is better for this manuscript.

-Embed sections of introduction only in a section.
-Abstract should be 250-350 words. See the following link http://jhealthscope.com/?page=public_pages&name=ms__abstract_and_keywords

-Keywords must be selected from Mesh, please revise them, and also “adsorption” needs to be necessary for the keywords list.
-Embed the “Objective” section in the previous section (introduction).
- Change section #3-2 “fabrication of chitosan-imprinted nZVI (CS@nZ)” to “synthesis of Nanocomposite “
- Change section # 4-1 to “Characterization of Nanocomposite”

- Mention to the characterization of synthesized nanocomposites such as FTIR, SEM and etc. in sections #3-2
-Table 1 is not necessary, show the functional groups in figure#1.
-Table 1 can be upload in a supplementary file.
-Separate TEM image from SEM image (Present them into 2 parts).
- For numbers in manuscript and table ≤ 9.99, use two digits beyond the decimal point; for numbers between 10.0 and 99.9, use one digit beyond the decimal point; and for concentrations ≥ 100, use the nearest whole number.

REFEREE: Reviewer | **Revision** (0) 3 May 2019

This paper is well presented and the results are important for environmental studies.
There are some typological and grammatical errors. It should be corrected.
The advantages of this method must be added.
Vendor information for instruments and chemicals must be given consistently and completely: (company and country name).
Spell of references must be checked.
The results must be compared with literature values such as maximum adsorption capacity as mg/g and samples.
The conclusion section must be improved.
The discussion is very weak. The authors should compare their data with that of other published work to bring about the advantages of this process.

REFEREE: Associate Editor | **Revision** (0) 5 May 2019

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REFEREE: EIC | **Revision (0)** 12 May 2019

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OPEN PEER REVIEW

Revision (1)

Reply to Reviewers

Ideally, the reviewing process can significantly improve the submitted manuscripts by allowing the authors to take into account the advice of reviewers. Author(s) must reply to all reviewers' comments in a separate Word file, point by point. A "**Reply to Reviewers**" document is submitted along with revised manuscript during submission of revised files, summarizing the changes that the authors made in response to the reviewers' comments. The responses to reviewers' comments specifies how the authors addressed each comment the reviewers made.

You can read the authors' responses to the reviewers' comments in the next page.

Manuscript Code: Manuscript Number: 91419

Manuscript Title: Adsorption of La (III) on Chitosan-Imprinted Nano Zero-Valent Iron Nanocomposite (CS@nZVI): Process Optimization, Isotherm, Kinetic, and Thermodynamic studies

Reviewer 1

Manuscript ID: 91419

Comments to the Author

We appreciate both, the reviewer's comments and her/his suggestions to improve the paper.

1. **This paper is well presented and results are important for environmental studies.**

   We want to thank the reviewer for his positive comment on the manuscript and results of our work.

2. **There are some typological and grammatical errors. It should be corrected.**

   Following the recommendation by the reviewer, we have exerted a comprehensive grammatical and typographical revision to improve the text´s readability. We appreciate your close attention.

3. **The advantages of this method must be added.**

   A suitable absorbent must have five conditions:
   1) Simple synthesis
   2) High adsorption rate

3) The ability to separate from the liquid medium (for example, being magnetic)
4) Non-toxicity
5) Availability and cost-affectivity

For achieve this purposes, we synthesize an adsorbent with the ability to have five of the above mentioned conditions. This study develops magnetic (Fe0) ion imprinted polymer, as a porous adsorbent with high regenerate capability, employed for adsorption of Lanthanum (III) content of wastewaters in the minimum time. Therefore, the present study was undertaken: (1) to characterize of Chitosan–Imprinted nZVI Nanocomposite (CS@nZVI) by SEM, BET, XRD, TEM, and FTIR; (2) to examine the adsorption efficiency of La (III) by synthesized CS@nZVI; (3) modeling and optimization of adsorption by R software (4) investigate the kinetic, thermodynamic, equilibrium and adsorption mechanisms; (5) explore CS@nZVI regeneration effect in adsorption capacity.

4. Vendor information for instruments and chemicals must be given consistently and completely: (company and country name).

Thank you for this suggestion. Following this comment, we have included the related information (about instruments and chemicals) in the revised script under the title "Applied apparatuses and techniques" (as the 2.3 section; Page 4-5, line 85-97). And its description is given here:

1.1. Applied apparatuses and techniques

The concentration of Lanthanum measurements was performed by ICP-AES (Spectro Model ARCOS FHE12). An electronic balance model Kern, ABJ 220-4NM was used to measuring the weights of the adsorbent. Solutions pH were observed by WTW inoLab pH 720 pH meter. A magnetic stirrer model IKA® C-MAG HS 7 (USA), was used for the mixing of the solutions. Samples agitation were done using orbital shaking incubator model (HOLDER 5000D Orbital motion). Scanning electron microscope (SEM); JSM-7100FA and X-ray diffractometer (XRD) Quanta Chrome, NOVA, 2000 were applied to study the morphology of nanocomposites. The particle size of CS@nZVI NCs

was observed by using Transmission Electron Microscope (TEM). The method of Brunauer–Emmett–Teller (BET) by N_2-adsorption in a Micromeritics Instrument Crop, GA, was applied to analyze the pore size distribution and surface area of CS@nZVI nanocomposites. A Bruke EQUINOX 55 (Germany) Fourier transform infrared (FT-IR) spectrometer was utilized to investigate the chemical structure of synthesized nanocomposites.

5. **Spell of references must be checked.**

   As you recommended, all references (In terms of accuracy and correctly numbered) were carefully rechecked and modified.

6. **The results must be compared with literature values such as maximum adsorption capacity as mg/g and samples.**

   According to your precious suggestion, we have further extended the Table 2 entitled: “Comparison of adsorption uptake of Lanthanum onto different adsorbents” to compare the performance of various similar adsorbents under similar experimental conditions, and their description was provided in Section 3.4.

7. **Conclusion section must be improved.**

   With regard to your comment; it seems that the complications of conclusion section were most likely related to its writing, which has been improved/ revised to make related contents clearer as far as possible following this comment, and in the new version of the paper, this section has been radically rewritten (Page 18-19, line 324-336).

8. **Discussion is very weak. The authors should compare their data with that of other published work to bring about the advantages of this process.**

Upon the reviewer's precious recommendations, we have further explained our obtained results and compared them with other published papers. For example:

These obtained data are close to the previous data of CS, and CS@nZVI in the literature (17) (Page 8, line 175-176).

In the previously conducted studies, similar findings were recorded (32) (Page 8, line 196-197).

Notice that the variables with negative signs (x_1, x_2^2, and x_3^2) have an antagonistic effect in adsorption of La (III), whereas the variables with positive signs (x_2, x_3 and x_4) show the positive relationship and have a synergistic effect on the removal efficiency and also in predicting the model response, as reported previously by Gupta et al. (28) (Page 15, line 251).

In the previous conducted studies, analogous model for the adsorption of La (III) on various adsorbents was observed (12). (Page 17, line 294-296).

Dear reviewer,

We really appreciate the time and efforts by you in reviewing this manuscript, and we are willing to finish the revised version of the manuscript including any further suggestion that you may have.

Sincerely,
Hassan Rasoulzadeh (Corresponding Author)

Reviewer 2

Manuscript ID: 91419

Comments to the Author

We appreciate both, the reviewer's comments and her/his suggestions to improve the paper.

1. **The title of "Adsorption of La (III) on Chitosan-Imprinted Nano Zero-Valent Iron Nanocomposite (CS@nZVI): Process Optimization, Isotherm, Kinetic, and Thermodynamic studies" is better for this manuscript.**

   It is true that this title can improve our article. Therefore, the suggested title has been included and highlighted in revised manuscript. We appreciate your close attention.

2. **Embed sections of introduction only in a section.**

   Upon the reviewer's precious recommendation, all sections of introduction are embedded and incorporated only into a section. Thank you for this suggestion.

3. **Abstract should be 250-350 words. See the following link http://jhealthscope.com/?page=public_pages&name=ms__abstract_and_keywords**

   Thank you for recognizing the number of words of abstract. Following this suggestion, abstract has been extensively rewritten.

4. **-Key words must be selected from Mesh, please revise them and also "adsorption" needs to be necessary in keywords list.**

According to your precious recommendation, we corrected the Key words as follow:

Keywords: Adsorption, Lanthanum; Optimization; Chitosan; Composite.

5. **Embed "Objective" section in previous section (introduction).**

Thanks a lot for this consideration. Recommended section (Objective) was embedded to introduction sections of the revised paper.

6. **Change section #3-2 "fabrication of chitosan-imprinted nZVI (CS@nZ)" to "synthesis of Nanocomposite "**

With the regard of your comment, we corrected and highlighted the mentioned section (Page 4, line 74).

7. **Change section # 4-1 to "Characterization of Nanocomposite"**

Again, thank you for this suggestion. Following this comment, we have changed this section and highlighted that in the revised script (Page 8, line 167).

8. **Mention to the characterization of synthesized nanocomposite such as FTIR, SEM and etc. in section #3-2**

Reviewer is right. The above-mentioned analysis were added the paper (in the beginning of section 3.1) and highlighted (Page 8, line 168-169).

9. **Table 1 is not necessary, show the functional groups on figure#1.**

It is true, may be Table 1 is not necessary. We have moved Table 1 to the supplementary file. Also, in Figure 1, the functional groups were indicated with the wavenumbers. Also, overlapped bands for each peak were presented.

10. **Table 1 can be upload in supplementary file.**

Following this comment, we have included this information (Table 1) in the supplement. Thank you for this comment.

11. **Separate TEM image from SEM image (Present them into 2 part).**

Appreciating your precious advices, we separated the recommended images (TEM and SEM) in the revised manuscript, and presented them into 2 part as you recommended.

12. **For numbers in manuscript and table ≤ 9.99, use two digits beyond the decimal point; for numbers between 10.0 and 99.9, use one digit beyond the decimal point; and for concentrations ≥ 100, use the nearest whole number.**

We appreciate your close attention and your valuable suggestion. As you recommended, all numbers have been checked and revised as far as possible following this comment.

Dear reviewer,

We really appreciate the time and efforts by you in reviewing this manuscript, and we are willing to finish the revised version of the manuscript including any further suggestion that you may have.

Sincerely,
Hassan Rasoulzadeh (Corresponding Author)

OPEN PEER REVIEW

Revision (1)

Here, you can see the **Reviewers**, **Associate Editors** and **EICs'** comments from the beginning to the end of the revision process.

REFEREE: Reviewer | **Revision** (1) 2 Jun 2019

dear editor

manuscript according to the reviewer's comments revised as perfect, So acceptable for publication in the health scope journal.

best regards

REFEREE: Associate Editor | **Revision** (1) 2 Jun 2019

Dear editor

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Best regards

REFEREE: EIC | **Revision** (1) 2 Jun 2019

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