



Rika Taslim <rikataslim@gmail.com>

Reviewer Invitation for REVISED VERSION JELECHEM-D-22-01047R1

1 message

Electroanalytical Chemistry <em@editorialmanager.com>
Reply-To: Electroanalytical Chemistry <support@elsevier.com>
To: "R. Taslim" <rikataslim@gmail.com>

Mon, Aug 29, 2022 at 8:30 PM

Ref: JELECHEM-D-22-01047R1

Title: Nanoarchitectonics with Beetroot Peel Waste Derived Activated Carbon for Improved Electrochemical Performances in Supercapacitors using Redox Additive Electrolyte

Authors: Megala Moorthy; Karnan Manickavasakam; Suresh Balaji S; Gokulnath Subramaniam; Sathish Marappan

Type: Research paper

Dear R. Taslim,

We have received a copy of the REVISED VERSION of the above-referenced manuscript. I would be grateful if you could give me an opinion on its suitability for publication, as you very kindly reviewed the original version.

You should treat this invitation, the manuscript and your review (as well as other reviewer comments shared with you) as confidential. You must not share your review or information about the review process with anyone without the agreement of the editors and authors involved, irrespective of the publication outcome. If the manuscript is rejected by this journal and the author agrees that the submission be transferred to another Elsevier journal via the Article Transfer Service, we may securely transfer your reviewer comments and name/contact details to the receiving journal editor for their peer review purposes.

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Yours sincerely,

Roberto Manuel M. Torresi, PhD
Editor
Journal of Electroanalytical Chemistry

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Original Referee Reports:

Reviewer 1: (Previous Version)

This manuscript presents a discussion of the electrochemical performance of Beet Root peel waste derived activated carbon-based supercapacitor. We have read and reviewed it carefully, so we have come to the decision that the current manuscript needs improvement before it can be published. There are important things related to novelty, accuracy in displaying data, neatness of data display, additional data, so in general it needs major revision. The following shows the points that need to be considered as a reference for improvement.

1. The experimental section should be written more completely and in detail so that it is easy to understand.
2. Note that the writing of units should be consistent, for example in Figures 5c, 6d, and 7c.
3. Give reasons for choosing a concentration of 0.01 M HQ, or you should try to display it for a different concentration of HQ, in Figure 7.
4. Also add EIS data, for different electrolytes H₂SO₄ with and without HQ.
5. Make a comparison table for the use of supercapacitor cells from several biomass materials with aqueous electrolyte added with redox additive electrolyte.
6. Please remove yellow background on Graphical abstract.

Reviewer 2: (Previous Version)

Including supporting information, this work successfully reports lots of experimental data. The manuscript is well organized. I basically recommend publication of this work for publication of this work in Journal of Electroanalytical Chemistry. However, several revisions are necessary. Especially, certain routine impression has to be removed.

- 1) In order to emphasize superiority and advantages of this work, comparisons of the main performance over the other materials reported in the past literatures have to be discussed in details.
- 2) Modification of the title upon inclusion of a new conceptual term may often effectively remove routine impression. I may suggest use of an emerging concept, nanoarchitectonics, in the title (as post-nanotechnology concept, see <https://pubs.rsc.org/en/content/articlelanding/2021/NH/D0NH00680G>). For example, the title like ... Nanoarchitectonics with Beetroot Peel Waste Derived Activated Carbon for Enhanced Electrochemical Performances in Supercapacitors using Redox Additive Electrolyte ... may sound more innovative.
- 3) Please add the initial figure to explain the used materials and their fabrication methods.
- 4) Addition of new references more may improve impression. Addition of more recent papers on biomass-derived carbon for supercapacitors and energy usages is recommended (for example, <https://www.journal.csj.jp/doi/10.1246/bcsj.20200314>, <https://www.sciencedirect.com/science/article/abs/pii/S1387181120306594?via%3Dihub>, <https://pubs.rsc.org/en/content/articlelanding/2021/CP/D1CP01726H>, <https://www.journal.csj.jp/doi/10.1246/bcsj.20210027>).
- 5) Please add error bar to plots in Figure 5c.
- 6) In Figure 5d, please well think about color contract and size for words in circles. These words cannot be seen well.
- 7) In Figure S1c, the vertical axis should be Transmittance (a.u.) (not Transmittance (%)) because this axis does not have values.

Reviewer 3: (Previous Version)

The manuscript titled < Enhancing the Electrochemical Performances of Beetroot Peel Waste Derived Activated Carbon-Based Supercapacitors using Redox Additive Electrolyte> by Moorthy et al. describe the synthesis of beet-room peel derived activated carbon and its use for supercapacitors. Although authors have done various physico-chemical and electrochemical characterizations, the application of this work for real-time supercapacitors is questionable one. Any craps that can be burned leads to carbon in the absence of air. Even authors reported aloe

vera, rice husks etc., in their previous publications. What is the use of reducing beet-root peel wastes in the environment? If so, how much beet-root peel waste negatively influences the environment? What is the need of converting beet-root peel waste into carbon?? Besides, authors used redox additives for the supercapacitor measurements. However, the rate capability of using redox additive at high current density is around 47 percentage only. Which means adding redox additive is not useful at high current density supercapacitors measurements. If the authors synthesized very high surface area carbon, then why did they use 20% SuperP?? This would exaggerate the specific capacitance/specific capacity calculated. Moreover, did the authors include this 20% SuperP also in the active material calculation?? Since both are carbon, SuperP has high conductivity and high surface area which contributes to the EDLC performance. Due to the lack of significance and poor rate capability of this material, the work has lower impact to the scientific community. I do not recommend this work for publication in a standard electrochemistry journal like JELECHEM. Therefore, I recommend REJECTION.

Reviewer 4: (Previous Version)

In this manuscript, authors prepare beetroot peel derived activated carbon as electrode material for supercapacitor first, and then study the performances of beetroot peel derived activated carbon-based supercapacitors in 1 M H₂SO₄ and 0.01 M HQ/H₂SO₄ solution. The HQ redox additive greatly enhances the performances of the fabricated symmetric supercapacitor. In general, this work is technically sound and should be publishable on Journal of Electroanalytical Chemistry after addressing following questions.

1. Authors seem to have forgotten to give the Scheme 1 on the possible reaction of HQ/Q.
2. The linear relationship between peak current and scan rate implies a surface-controlled reaction. Therefore, the author's description and conclusion of Fig. S3 are confusing.
3. In this manuscript, as redox additive, HQ can improve the capacitance of supercapacitor. However, HQ may shuttle diffusion between anode and cathode, resulting in low coulomb and energy efficiencies. If the coulomb and energy efficiencies of a supercapacitor are too low, the supercapacitor is useless in practical application. Therefore, as important metric of energy storage material and device, coulomb and energy efficiencies under different current densities in 1 M H₂SO₄ and 0.01 M HQ/H₂SO₄ solution should be calculated and compared.

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Rika Taslim <rikataslim@gmail.com>

JELECHEM-D-22-01047R1: Review Completed

1 message

Roberto Manuel M. Torresi <em@editorialmanager.com>
Reply-To: "Roberto Manuel M. Torresi" <rtorresi@iq.usp.br>
To: "R. Taslim" <rikataslim@gmail.com>

Wed, Sep 7, 2022 at 10:36 AM

Ms. No.: JELECHEM-D-22-01047R1

Title: Nanoarchitectonics with Beetroot Peel Waste Derived Activated Carbon for Improved Electrochemical Performances in Supercapacitors using Redox Additive Electrolyte

Corresponding Author: Dr. Sathish Marappan

All Authors: Megala Moorthy; Karnan Manickavasakam; Suresh Balaji S; Gokulnath Subramaniam; Sathish Marappan

Dear Dr. Taslim,

This is to confirm that we have received your review for the manuscript referenced above. At a time when pressure on referees is increasing, the editors of the Journal of Electroanalytical Chemistry particularly appreciate your helpful contribution to the peer review process.

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With kind regards,

Roberto Manuel M. Torresi, PhD
Editor
Journal of Electroanalytical Chemistry

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