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Submisi awal	Facile-green preparation of bleaching earth for palm oil refinement and feasibility evaluation of the spent bleaching earth
Judul setelah revisi	Saponin-intercalated organoclays for adsorptive removal of b-carotene: Equilibrium, reusability, and phytotoxicity assessment

A manuscript number has been assigned: JTICE-D-20-01049

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Ms. Ref. No.: JTICE-D-20-01049
Title: Facile-green preparation of bleaching earth for palm oil refinement and feasibility evaluation of the spent bleaching earth
Journal of the Taiwan Institute of Chemical Engineers

Dear Dr. Shella Permatasari Santoso,

Your submission "Facile-green preparation of bleaching earth for palm oil refinement and feasibility evaluation of the spent bleaching earth" has been assigned manuscript number JTICE-D-20-01049.

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Ms. Ref. No.: JTICE-D-20-01049
Title: Facile-green preparation of bleaching earth for palm oil refinement and feasibility evaluation of the spent bleaching earth
Journal of the Taiwan Institute of Chemical Engineers

Dear Dr. Shella Permatasari Santoso,

Thank you for your recent submission to Journal of the Taiwan Institute of Chemical Engineers. We have now received the reviewers' reports on your manuscript, which are copied below or attached. The reviewers feel that major modifications are necessary before publication can be considered.

If you feel that you can suitably address the reviewers' comments,I invite you to submit a revised manuscript. The revised manuscript may be subject to further peer review prior to reaching a final decision on acceptance. The revised manuscript should be submitted by Nov 09, 2020.

Please revise your manuscript within this time, if you need additional time to complete your revision, please let us know by replying to this email and informing us of the date you expect to submit it. Otherwise, we will assume that you are not sending a revision and the manuscript will be inactivated.

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I look forward to receiving your revised manuscript.

Yours sincerely,

Dong-Hwang Chen
Deputy Editor
Journal of the Taiwan Institute of Chemical Engineers

Reviewers' comments:

Reviewer #1: In this manuscript, the authors provided a green bleaching earth prepared with plant surfactant and bentonite for palm oil refinement and feasibility
evaluation of the spent bleaching earth. It is interesting to design the green bleaching earth, which is different from the traditional ones, but numerous problems are observed in this manuscript, and thus it is difficult to accept this manuscript for publication at the present state.
Comments:
1. Bentonite should be treated with diluted HCl, and then modified with Rarasaponin. It might be in favor of enhancing the adsorption capacity toward coloring matter of palm oil.
2. Why the adsorption properties of bleaching earth sharply decreased with the regenerated spent earth using organic solvent?
3. Why the spent BR was washed using deionized water after being washed using hexane? What are removed during washing using water?
4. Why the specific surface area of BR1.0 is greater than that of BR5.0, which is self-contradictory with the statement of the order of the specific aurface area.
5. Please provide the TEM images of raw bentonite and the modified ones. The SEM images presented that the aggregations of the samples are serious, which might be adverse toremove the coloring matter from palm oil.

6. Why the BR5.0 with the largest specific surface area and pore volume present the poor adsorption properties compared with that of BR1.0?
7. Please provide the relevant characterizations to analyze the formation mechanism of rarasaponin-intercalated bentonite, as shown in Fig.4, and the XRD results is inadequate to support this mechanism.
8. Please analyze the adsorption mechanism based on the relevant characterizations.

Reviewer #2: I have some comments.
-Is rarasaponin safe for human?

-Section 3.1, Fig. 4c, How are the authors sure that the negatively charged rarasaponin caused cations leaching and leads to the formation of rarasaponin intercalated bentonite? Do the authors have any evidences to support this sentence?
-Section 3.2.1, Why did BRs remove B-carotene better that RAw-B? Please explained clearly.
-Table 2, Please indicated what is FFA and PV in full name.
-Please compared a new adsorbent, BRs with commercial clay in term of % B-carotene removal and adsorption capacity.
-How did saponin increase the efficiency of bentonite compared with Raw-B?
-Table 1 should change to the graph of FTIR in order to see the graphs of different BR samples compared to Raw-B and rarasaponin.
-In order to prove mechanism in Fig. 4c, elution test is needed to be confirmed.
-Table 2, please compared the results with commercial clay.
-How did the CEC value of the BRs cause the expansion of the surface area and the interlayer spacing of the bentonite. Please explained.
-Fig. 5 is not clear to me. Please make it clear.
-Qmax in Table 3 should compare with other studies and commercial clay.
-Why did the authors should BR1.0 instead of BR5.0?
-Surface area of BR0.1,0.5, 1.0, 5.0 are not much different but the efficiency is different. Why? Please explained.

Reviewer #3: The work is properly performed and has novelty. The feasibility of the used method has been discussed. Reusability and biological response were demonstrated, which is good. It is proposed to be published after adding more information to conclusions.

Reviewer #4: I have given this major revision because the authors need to do a fair bit of work on their English, preferably with the aid of a native English-speaking editor. While most of the text is fully understandable these changes should be made in the interests of the journal's reputation. There are some other issues to be attended to, but please note my English corrections here are not exhaustive, merely representative.
Minor
Define acronyms like CTAB at the first point of us in the main text.
Not limited to the performance of these synthesized bleaching earths, their reusability was evaluated.
.. rewrite in better English.
hexane anhydrous (C6H14, 95%), .. what is this? I don't understand how you could have hydrous or hydrated hexane, here from the internet is the following material: Water and hexane are immiscible. Water is a polar covalent substance and hexane is nonpolar. Like dissolve like. Water can dissolve polar solutes and some ionic compounds, but not nonpolar solutes. Hexane can dissolve nonpolar substances, but not polar substances.
Why the big chunks of bentonite.. this would make it difficult to react with anything, how big, did you grind it?
and is composed of:
Lines of numbers and symbols make for poor reading, consider creating a table:
order of Raw-B<BR0.1<BR0.5<BR1.0<BR5.0, where the value is found to be 173.551, 179.109, 246.763, 248.787, and 235.168 m2/g, respectively. The calculated total pore volume is 0.204, 0.205, 0.295, 0.311, and 0.358 cm3/g for Raw-B, BR0.1, BR0.5, BR1.0, and BR5.0,

Most of the numbers in Table 1 are very similar, so what am I too make of them for instance is 1259.7 very different from 1261.8 and if I were to repeat these measurements would the variation swamp the first decimal place precision? Do we need this table?

Looking at Fig. 4 it appears the groups in (A) are -O-O-C2H3, my understanding of an acetyl group is that it is something like CH3-C=O with the carbon connected to some other atom, what you describe looks like a peroxy compound:
(90.48 %removal), format things properly, there is no %removal.

Table 2 the two decimal precision makes no sense in this table, e.g. 177.35 plus or minus 29.93.
Freundlich is the isotherm .. you need to use articles.
Specifically, BR1.0 has more excellent .. just: is a better
Still and all, the preparation method .. I don't know where Still and all came from, but it is not English I am familiar with.
Reusability study of the spent bleaching earth was showed .. no such construction as was showed.

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Article title: Saponin-intercalated organoclays for adsorptive removal of b-carotene: Equilibrium, reusability, and phytotoxicity assessment
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Dr. Shella Permatasari Santoso
Chemical Engineering
Widya Mandala Catholic University
shella@ukwms.ac.id
Surabaya
Indonesia
Phone: not available
Fax: not available
E-mail: shella_p5@yahoo.com

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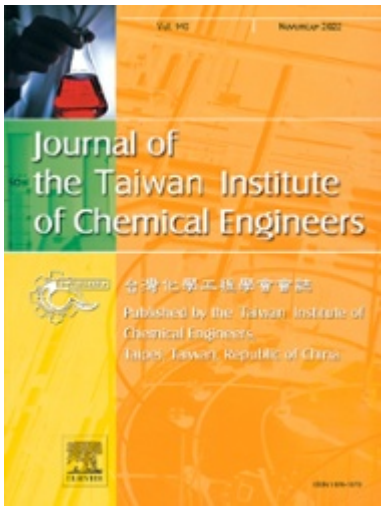

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Saponin-intercalated organoclays for adsorptive removal of b-carotene: Equilibrium, reusability, and phytotoxicity assessment

--Manuscript Draft--

Manuscript Number:	JTICE-D-20-01049R1
Article Type:	Original Paper
Section/Category:	Materials Science and Technology
Keywords:	Rarasaponin; Microwave irradiation; carotene; Adsorption isotherm; Reusability; Phytotoxicity
Corresponding Author:	Shella Permatasari Santoso Widya Mandala Catholic University Surabaya, INDONESIA
First Author:	Shella Permatasari Santoso
Order of Authors:	Shella Permatasari Santoso
	Artik E Angkawijaya
	Maria Yuliana
	Vania Bundjaja
	Felycia E Soetaredjo
	Suryadi Ismadji
	Alchris W Go
	Phuong L Tran-Nguyen
	Alfin Kurniawan
	Yi-Hsu Ju
Abstract:	Acid-activated clays play an essential role in the edible oil refining industry to remove colored pigments and impurities to meet consumer demands and specific purposes. Despite its high bleaching activity, the use of highly corrosive acids in significant quantities for producing the activated clay raises safety and environmental concerns. Herein, we demonstrate an environmentally friendly and low-cost preparation of organoclay-type bleaching earth via aqueous phase intercalation of bentonite with natural surfactant (rarasaponin) under microwave irradiation. The influence of the rarasaponin concentrations on the textural and chemical characteristics of the resultant organoclays was investigated with relevant techniques, including SEM, XRD, FTIR, and N 2 sorption. The results revealed that the intercalation of rarasaponin causes a basal spacing increase to 1.50 nm, surface area to 99.5 m 2 /g, and pore volume to 0.85 cm 3 /g, while the cation exchange capacity (CEC) value decreased to 19.1±4.4 meq/100g; where the untreated bentonite has a basal spacing of 1.39 nm, a surface area of 86.8 m 2 /g, a pore volume of 0.69 cm 3 /g, and a CEC value of 30.1±3.6 meq/100g. The RSB-2 organoclay exhibits the best bleaching activity, with ~91% b -carotene removal efficiency achieved in degummed palm oil compared to the untreated bentonite (72% efficiency). The equilibrium behavior of b -carotene adsorption onto RSB-2 organoclay) was best fit with the Redlich–Peterson isotherm model, giving the theoretical maximum sorption capacity (q max) 78.09 mg g -1 , which represents the best-reported values among the investigated samples. A reusability study of the spent bleaching clay demonstrates that the adsorptive removal of b -carotene remained greater than 90% after five consecutive cycles. The spent RSB-2 organoclays also showed no appreciable phytotoxicity toward Arabidopsis seed germination but a slight inhibitory activity on the root development, suggesting environmentally friendly behavior and allowing for the landfill disposal.
Suggested Reviewers:	Ali Ahmadpour ahmadpour@um.ac.ir

	Richard Gunawan r.gunawan@curtin.edu.au
	Ianatul Khoiroh Ianatul.Khoiroh@nottingham.edu.my
	Ahmed Fazary aefazary@kku.edu.sa
	Jaka Sunarso jsunarso@swinburne.edu.my
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Ms. Ref. No.: JTICE-D-20-01049
Title: Facile-green preparation of bleaching earth for palm oil refinement and feasibility evaluation of the spent bleaching earth
Journal of the Taiwan Institute of Chemical Engineers

Dear Editor,

Attached please find the revised version of our article. We would like to thank the editor and the reviewers and sincerely appreciate the time and efforts taken to review and give positive and helpful suggestions on our original submission.

In this revised manuscript, we have carefully addressed all the comments raised by the reviewers and responded to each of their comments in a point-by-point fashion. The changes and additions made in the revised manuscript are highlighted in dark red. We hope the editor and the reviewers will be satisfied with our response to the 'comments' and the revision for this manuscript for reconsideration by the journal.

Thank you for giving us the opportunity to revise this manuscript and I look forward to hearing from you soon.

Sincerely,

Shella Permatasari Santoso
Associate Professor
Department of Chemical Engineering
Widya Mandala Surabaya Catholic University, Indonesia