



Submissions

20611 / **Iqbal Syaichurrozi, Sarto Sarto, Wahyudi Budi Sediawan, Muslikhin Hidayat** / Effect of Fe Addition on Anaerobic Digestion Process in Treating Vinasse: Experimental and Kinetic Studies

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iqbal syaichurrozi <iqbalsyaichurrozi@gmail.com>

[CH] Editor Decision: 20611

1 message

Periodica Polytechnica Chemical Engineering <pp.ch@bme.hu>

Mon, Aug 15, 2022 at 7:40 PM

Reply-To: Periodica Polytechnica Chemical Engineering <pp.ch@bme.hu>

To: Iqbal Syaichurrozi <iqbalsyaichurrozi@gmail.com>, sarto sarto <sarto@ugm.ac.id>, Wahyudi Budi Sediawan <wbsediawan@ugm.ac.id>, Muslikhin Hidayat <mhidayat@ugm.ac.id>

Dear Iqbal Syaichurrozi, sarto sarto, Wahyudi Budi Sediawan, Muslikhin Hidayat,

We have reached a decision regarding your submission to Periodica Polytechnica Chemical Engineering, "Effect of Fe Addition on Anaerobic Digestion Process in Treating Vinasse: Experimental and Kinetic Studies".

Our decision is: **Resubmit for Review (Major revision)**

This means that we ask you to carefully consider the reviewer's remarks (see below), modify the paper accordingly, and then upload a major revision. Please consider also the formatting checklist attached and strictly follow the instructions to meet the requirements of the journal and reduce the length of publication process. **The deadline of the revision is the 9th of September.**

Please go to the **Review page** of your paper. Scroll down to the **Revisions** section and press the **Upload File**. Please do not use the Discussion section to upload your files.

Please upload the following files:

- 1) a document that answers point-by-point the reviewers' comments. Please note that some of these answers might be relevant to be included to the revised text.
- 2) the revised final version of the paper in Word format (doc or docx).
- 3) the revised version of the paper with the changes tracked (doc or docx format).
- 4) each figure also in separate files. Format and quality requirements: <https://pp.bme.hu/ch/about/submissions>.

Your cooperation would help the copyediting process that will start after acceptance. Your cooperation in following the formatting guidelines and during the copyediting process could largely accelerate the publication of your work with receiving a DOI number within a short time.

Best regards,

Gábor Márk Tardy

PPCE editor

Reviewer#1

=====

I have reviewed the manuscript titled "Effect of Fe Addition on Anaerobic Digestion Process in Treating Vinasse: Experimental and Kinetic Studies". This study is very interesting. I support this manuscript to be published in the PPCE journal. Some revisions should be conducted by the authors to increase the manuscript quality.

Abstract

- "...vinasse because that it converts..." should be "...vinasse because it converts..."
- "...increasing the Fe concentration until 0.99 g/L" should be "...increasing the Fe concentration to 0.99 g/L"
- The kinetic constant symbols in the abstract should be explained so that the readers understand the meaning of the symbols
- "The addition of Fe until 0.29 g/L was recommended to increase the quantity and quality of biogas production" please add the important data to explain the quantity and quality of biogas production

Introduction

- "...from 174 mega ton of equivalent..." should be "...from 174 mega tons of equivalent..."

- There are many empirical kinetic models, one of them is the modified Gompertz model. What are the advantages of this mechanistic model compared to the empirical kinetic model? Please add your explanation in the Introduction

Methods

- Why the vinasse is diluted using water with a ratio of 70:30 (v/v)? Please explain that
- Why the Substrate/Inoculum is 3.5/1? Please add your references
- “The VFAs (g acetic acid/L) was analyzed by using a steam distillation method. The total microbial cell account (cell/ μL)”. Please add your references

Results and Discussion

- Please add a discussion about the comparison of the value of the kinetic constants in this study with previous studies.

Reviewer#2

=====

The article is haphazardly written. I think that the authors did not discuss all the results presented in the tables and charts. It looks very much. Authors should not use abbreviations unless they explain them. There is no statistical analysis of the results presented.

There is no discussion of the results with the world literature. These are serious errors that will automatically disqualify the manuscript.

Reviewer#3

=====

The theme of this ms is very important and current. We think the circular economical management and production of energy.

The goal of this ms is to study the effect of Fe concentration on AD process in treating the vinasse.

The result of study is interesting, but it has a acceptable explanation.

It is well known that the concentration of Fe significantly affected the methane formation stage, but not the acid formation stage.

The addition of Fe until 0.29 g/l is recommended, what is the situation in the case of 0,30 g/l?

Please, study and use the examples for the Authors!

What is dan?

Reviewer#4

=====

Vinasse is produced in a huge amount as a waste /by-product stream in fermentation industries. Because of its high organic matter content, it has a great potential for biogas productions. But, there is needed to develop methods –such as micronutrients dosage- to increase the efficiency of AD, improve the methane yield and improve the economy of the processes. Therefore, the topic of the manuscript 122348-1 can be considered as interesting for the readers.

The manuscript is generally well structured and well written. Introduction summarizes well the relevance of the study.

Applied methods are adequate and described well, in details.

The manuscript contains interesting results that have practical relevance, as well. Experimental results and results of kinetic analysis and modeling are discussed in details with relevant references. Tables and figures represent well the results.

Comments:

Please provide the standard deviations for COD, TFA, TS, microbial count, pH in section 2.1 (characterization of vinasse and inoculum).

Was the inoculum preliminary adopted to vinasse?

How was the level of Fe dosage determined/selected?

The difference between 'Run 1-5 ' was just the Fe dosage. Therefore, I suggest to give the dosage in figures (instead of 'run No').

Please improve the visibility of figures (mainly text and axis labels).

Editor's comments

=====

On Fig. 4. the correlation seems to be quite unsubstantiated without negative deltaVFA points. Please explain!

Reviewer#1

Reviewer's comments	Authors' responses
<p>I have reviewed the manuscript titled "Effect of Fe Addition on Anaerobic Digestion Process in Treating Vinasse: Experimental and Kinetic Studies". This study is very interesting. I support this manuscript to be published in the PPCE journal. Some revisions should be conducted by the authors to increase the manuscript quality.</p>	<p>Thank you so much.</p>
Abstract	
<ul style="list-style-type: none"> • "...vinasse because that it converts...." should be "...vinasse because it converts...." 	<p>Thank you. We have revised the sentence. Please check the abstract (Page 1)</p>
<ul style="list-style-type: none"> • "...increasing the Fe concentration until 0.99 g/L" should be "...increasing the Fe concentration to 0.99 g/L" 	<p>Thank you. We have revised the sentence. Please check the abstract (Page 1)</p>
<ul style="list-style-type: none"> • The kinetic constant symbols in the abstract should be explained so that the readers understand the meaning of the symbols 	<p>Thank you. We have revised the sentence. Please check the abstract (Page 1)</p>
<ul style="list-style-type: none"> • "The addition of Fe until 0.29 g/L was recommended to increase the quantity and quality of biogas production" please add the important data to explain the quantity and quality of biogas production 	<p>Thank you. We have revised the sentence. Please check the abstract (Page 1)</p>
Introduction	
<ul style="list-style-type: none"> • "...from 174 mega ton of equivalent..." should be "...from 174 mega tons of equivalent..." 	<p>Thank you. We have revised the sentence. Please check the introduction, Page 1.</p>
<ul style="list-style-type: none"> • There are many empirical kinetic models, one of them is the modified Gompertz model. What are the advantages of this mechanistic model compared to the empirical kinetic model? Please add your explanation in the Introduction 	<p>Thank you. We have added explanations about the empirical models and the comparison between the empirical models with the mechanistic model in this study. Please check the introduction, Page 2.</p>
Methods	
<ul style="list-style-type: none"> • Why the vinasse is diluted using water with a ratio of 70:30 (v/v)? Please explain that 	<p>Thank you. We have added the explanation and then the reference. (section 2.2, Page 2)</p>

<ul style="list-style-type: none"> • Why the Substrate/Inoculum is 3.5/1? Please add your references 	Thank you. We have added the reference (section 2.2, Page 2)
<ul style="list-style-type: none"> • “The VFAs (g acetic acid/L) was analyzed by using a steam distillation method. The total microbial cell account (cell/μL)”. Please add your references 	Thank you. We have added the reference (section 2.3, Page 3)
Results and Discussion	
<ul style="list-style-type: none"> • Please add a discussion about the comparison of the value of the kinetic constants in this study with previous studies. 	<p>Thank you. We have added a comparison between the kinetic constant values in this study and the other studies.</p> <p>(Page 7, Table 4 (Page 9), Table 5 (Page 9))</p>

Reviewer#2

Reviewer's comments	Authors' responses
The article is haphazardly written. I think that the authors did not discuss all the results presented in the tables and charts. It looks very much.	Thank you. We have added discussions to explain the data presented in tables and figures. Please check: Page 5, Page 6, Page 7, Page 9
Authors should not use abbreviations unless they explain them.	Thank you. We have checked and revised. Before we write the abbreviations, we have written the full terms first.
There is no statistical analysis of the results presented.	Thank you. We have added the error bar in the characteristics of vinasse and inoculum in section 2.1 (Page 2).
There is no discussion of the results with the world literature.	Thank you. We have added Tables 4 and 5 (Page 9) to compare the kinetic constants in this study with the other studies.
These are serious errors that will automatically disqualify the manuscript.	Thank you. We have revised the manuscript. Please check all revisions that we have done on the manuscript. We hope this version is much better.

Reviewer#3

Reviewer's comments	Authors' responses
<p>The theme of this ms is very important and current. We think the circular economical management and production of energy.</p> <p>The goal of this ms is to study the effect of fe concentration on Ad process in treating the vinasse.</p> <p>The result of study is interesting, but it has a acceptable explanation.</p> <p>It is well known that the concentration of Fe significantly affected the methane formation stage, but not the acid formation stage.</p>	<p>Thank you so much.</p>
<p>The addition of Fe untul 0.29 g/l is recommended, what is the situation in the case of 0,30 g/l? Please, study and use the examples for the Authors!</p>	<p>Thank you. Basically, the Fe 0.29 is equal to 0.30. We have written the value of 0.29 because we have chosen the decimal places = two numbers.</p>
<p>What is dan?</p>	<p>Thank you. We are so sorry. "dan" is a typo. We mean "and". We have revised it. Please check : Page 1 and Page 3 (green highlights)</p>

Reviewer#4

Reviewer's comments	Authors' responses
<p>Vinasse is produced in a huge amount as a waste /by-product stream in fermentation industries. Because of its high organic matter content, it has a great potential for biogas productions. But, there is needed to develop methods – such as micronutrients dosage- to increase the efficiency of AD, improve the methane yield and improve the economy of the processes. Therefore, the topic of the manuscript 122348-1 can be considered as interesting for the readers.</p> <p>The manuscript is generally well structured and well written. Introduction summarizes well the relevance of the study. Applied methods are adequate and</p>	<p>Thank you so much.</p>

<p>described well, in details. The manuscript contains interesting results that have practical relevance, as well. Experimental results and results of kinetic analysis and modeling are discussed in details with relevant references. Tables and figures represent well the results.</p>	
<p>Please provide the standard deviations for COD, TFA, TS, microbial count, pH in section 2.1 (characterization of vinasse and inoculum).</p>	<p>Thank you. We have added the standard deviations. Please check : section 2.1 (Page 2)</p>
<p>Was the inoculum preliminary adopted to vinasse?</p>	<p>Thank you. There is no acclimatitaton for the microbe. We have written the sentence: “Furthermore, the inoculum, which was without acclimatization first, was added with the ratio of 3.5 ± 0.1 (basis of g total COD / g VS) [16].” Please check : section 2.1 (Page 2)</p>
<p>How was the level of Fe dosage determined/selected?</p>	<p>Thank you. We have written the sentence: Based on the Table 1, the Fe concentration was varied in the range of 0.06 - 0.99 g/L. In summary, the range of recommended Fe concentration in AD was $>0.00028 - \leq 5.65$ g/L [6,17]. Therefore, the Fe concentration varied in this study was in the range of the recommended Fe values based on the other studies [6,17]. Please check : section 2.1 (Page 2)</p>
<p>The difference between 'Run 1-5 ' was just the Fe dosage. Therefore, I suggest to give the dosage in figures (instead of 'run No').</p>	<p>Thank you so much for your suggestion. Information about the Fe dosage has been written in the Title of the figures. Please check: Figure 2 (Page 5) Figure 3 (Page 6) Figure 5 (Page 8) Figure 6 (Page 10)</p>
<p>Please improve the visibility of figures (mainly text and axis labels).</p>	<p>Thank you. We have revised the Figures. Figure 2 (Page 5) Figure 3 (Page 6) Figure 4 (Page 6) Figure 5 (Page 8) Figure 6 (Page 10) Figure 7 (page 11)</p>

Editor's comments

Editor's comments	Authors' responses
<p>On Fig. 4. the correlation seems to be quite unsubstantiated without negative deltaVFA points. Please explain!</p>	<p>Thank you. We have added the explanation about the Figure.</p> <p>“The Fig. 4 was built by setting the intercept value of 0 because it was assumed that the substrate pH was just affected by the VFA concentration. In other words, the ΔpH was appropriate with ΔVFA. Hence, the basic correlation can be written in Eq. 23a.</p> $\Delta VFA = \beta \Delta pH \quad (23a)$ <p>Where β is slope</p> <p>Based on the Fig. 4, the Eqs. 23b-25 showed the ΔVFA as function of ΔpH. The Eq.25 can be used to predict the VFA concentration by using the substrate pH changes with the assumption that the total ammonium nitrogen was ignored. Therefore, the AD process in treating substrates with high carbon content and low total nitrogen content can consider using the Eq. 25 in predicting the VFA profiles by knowing the substrate pH.</p> $\Delta VFA = -7.8542 \Delta pH \quad (R^2 = 0.62) \quad (23b)$ $VFA_2 - VFA_1 = -7.8542 (pH_2 - pH_1) \quad (24)$ $VFA_2 \left(\frac{g \text{ acetic acid}}{L} \right) = VFA_1 \left(\frac{g \text{ acetic acid}}{L} \right) - 7.8542 (pH_2 - pH_1) \quad (25)$ <p>In detail, the correlation between the substrate pH and the VFA had a correlation determination (R^2) of 0.62. It means that about 62% of the substrate pH was affected by the VFA value and about 38% of the substrate was affected by the other factors. In theory, the ammonium nitrogen resulted from the degradation of nitrogen sources (such as protein). The ammonium can increase the substrate pH. Because the ammonium concentration was not considered in the correlation, the correlation determination (R^2) value was not high enough.”</p> <p>Please check: Page 6-7</p>



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[CH] Editor Decision: 20611

1 message

Periodica Polytechnica Chemical Engineering <pp.ch@bme.hu>

Mon, Sep 12, 2022 at 4:21 PM

Reply-To: Periodica Polytechnica Chemical Engineering <pp.ch@bme.hu>

To: Iqbal Syaichurrozi <iqbalsyaichurrozi@gmail.com>, sarto sarto <sarto@ugm.ac.id>, Wahyudi Budi Sediawan <wbsediawan@ugm.ac.id>, Muslikhin Hidayat <mhidayat@ugm.ac.id>, Anna Dobóczy <doboczy.anna@bme.hu>, Alma Véghseő <veghseo.alma@bme.hu>

Dear Iqbal Syaichurrozi, sarto sarto, Wahyudi Budi Sediawan, Muslikhin Hidayat,

We have reached a decision regarding your submission to Periodica Polytechnica Chemical Engineering, "Effect of Fe Addition on Anaerobic Digestion Process in Treating Vinasse: Experimental and Kinetic Studies".

Our decision is: **Accept Submission**

Our Copy Editor will check all formatting including figure and bibliography requirements and lets typesetting start only when all of them are met. Your cooperation during the copyediting process could largely accelerate the publication of your work. Your paper will immediately receive a DOI and will appear in the "online first" section of the journal as soon as typesetting is ready.

Thanks for your cooperation and best regards,

Gábor Márk Tardy

PPCE editor

Periodica Polytechnica Chemical Engineering
<https://pp.bme.hu/ch>