

Research/Review Paper

Author's Guide for Manuscript Preparation for Chemical and Engineering *(length of not more than 3 lines is recommended)*

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Abstract: The abstract should be cohesive and adequate implying the research question and major findings as a standalone paragraph. No references or abbreviations are required in this section. Also, the abstract section should not be less than two hundred (200) words and does not exceed two hundred fifty (250) words. It should be placed under the title with a single space from the title. Avoid writing a long formula and define all symbols used in the abstract. The abstract should be a single paragraph with the following content: **Background:** highlight the targets of the research; **Methods or process:** concise description of the main processes or methods applied in the research work; **Results:** present the article's main findings or significant results and the author should avoid the discussion of the results in the abstract; **Conclusion:** the main conclusions of the research work that can be drawn should be present without magnify the conclusions.

Keywords: Biodiesel, Chlorella sp, Microwave, In Situ Transesterification (should be included in a separate paragraph. Maximum 5 keywords (words or phrases).

1. Introduction

The rapid increase in energy consumption, especially in the transportation sector, has led to an energy crisis that has resulted in a decrease in fossil fuel supplies and an increase in environmental pollution [1]. The paper should be organized into logical parts or sections. Any subsection is given a brief numbered heading. The contents include the introduction that should clearly define the nature of the problem, and the references should be made to previously published papers. Theoretical, experimental, results, discussions and conclusions form the main sections of the paper. The theoretical section extends the analytical background of the article and develops a new formulation of the problem. Calculations are achieved here using the developed equations and the modifications should be pointed out. Depending on the suggested research methods, the experimental investigation is achieved, using the testing instruments or design and manufacturing a test rig. Materials and methods are detailed here. In the results and discussions section, the significance of the obtained results should be pointed out and the citations and the discussions of the kinds of literature should be avoided in this section. Sometimes results and discussions are combined in one section.

2. Research and Methodology

2.1 Materials (Heading two)

The theoretical section extends the analytical background of the article and develops a new formulation of the problem. Calculations are achieved here using the developed equations and the modifications should be pointed out. They should be described with sufficient detail to allow others to

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2.2 Experiments

The reactors consist of a centrally oriented conversion chamber within its' set-up and possessing several small air holes at the base. The chamber houses the feed to be converted while the combustion fuel for heat generation occupies the 'heating gap' between the chamber and the reactor itself.

2.3 Product characterization

The products (biomass biochar and hybrid biochar) recovered from the process were characterized to ascertain some of their properties using Scanning Electron Microscope with energy Dispersive X-ray Spectroscopy (SEM-EDS), Fourier Transform Infra-Red Spectroscopy (FTIR) and Brunauer-Emmet-Teller (BET) analysis. Scanning Electron Microscopy (SEM, Phenom proX, Phenom-World BV, Netherlands) was used to study the surface morphology of the particles of the biochar. A double adhesive was placed on a sample stub. The sample was sprinkled on the sample stub and subsequently taken to a sputter coater (quorum-Q150R Plus E) and coated with 5 nm of gold.

3. Results and Discussion

3.1 Temperature profile

This section focused on the precise description of the experimental or theoretical results. The interpretation of the results and their conclusions should also present in this section. Authors should discuss the results and how they can be interpreted in viewpoint of research works found in the literature and of the working hypotheses. The results and their implications should be discussed in the broadest context possible.

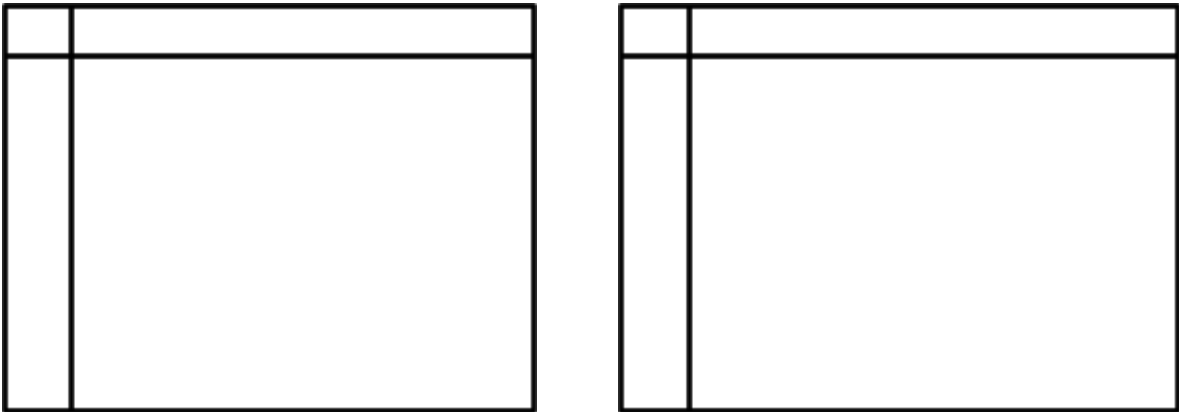


Figure 1. The figures with high resolution, with using high-quality graphical tools (JPEG and PNG format)

3.2 Product yield

The bio-char yield for both processes was computed using the system in eq. 1.

$$m_{Bio-char} = (M_3 - M_2) \quad (1)$$

$$Yield_{Bio-char} = \frac{m_{Bio-char}}{m_{raw}} \times 100\% \quad (2)$$

Where M_1 = mass of conversion chamber + Feed (in grams), M_2 = mass of conversion chamber (in grams), M_3 = summarized in Table 1.

Table 1. Tables should be placed in the main text near to the first appearance in the text

Index	Title A	Title B
Entry A	data	data
Entry B	data	data
Entry C	data	data
Entry D	data	data
Entry E	data	data
Entry F	data	data

3.3 Product composition

The composition of the products was determined using Energy Dispersive X-ray spectroscopy (EDS). The spectrums are shown in Figures 2 and the results summarized in Table 2. The only major component missing is Hydrogen. From the results in Table 2, it can be observed that the hybrid.

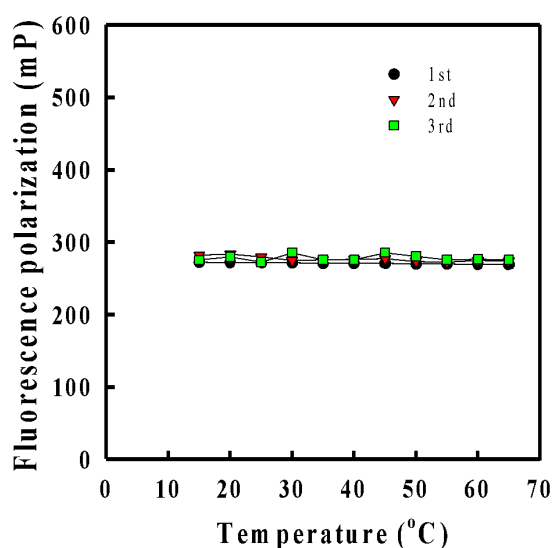


Figure 2. The mechanism of the ... [14]

3.5 Biochar functional groups

Table 3 shows the functional groups of raw correspond to the alkoxyl (C-OH) group The peak 1635 cm^{-1} observed in the biomass spectra which shifted to 1620 cm^{-1} and 1573 cm^{-1} in biomass. Retort heating also underlines the usability of the process even in remote locations or in on-site.

4. Conclusion

A conclusion should point out the distinguished results of the achieved work and do not replicate the abstract. A conclusion may suggest recommendations for work extension and new applications.

Author contributions: Conceptualization, xx. and xx; data curation, X.X.; formal analysis, X.X.; investigation, X.X.; methodology, xx.; project administration, X.X, resources, X.X.; software, X.X.; supervision, X.X.; validation, X.X., Y.Y. and Z.Z.; visualization, X.X.; writing—original draft preparation, X.X.; writing—review and editing, X.X. All authors have read and agreed to the published version of the manuscript.

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Conflict of Interest: The authors declare that there are no conflicts of interest.

5. References

References should be following the *IEEE Style*. References to journal articles or any work should include the year of publication, full title, the full name of the publication in which it appeared, volume number and page numbers of the cited article. References to textbooks and technical reports should include the year of publication, full title, publisher, city of publication and the page numbers of the work being cited. Reference numbers are set flush left and form a column of their own content of the reference. The reference numbers are on the line, enclosed in square brackets. In all references, the given name of the author or editor is abbreviated to the initial only and precedes the last name. The abbreviations should be used such as Dept. instead of Department, Eng. instead of Engineering, and Univ. instead of University. A space of (6 pt. line space) is left between two references. The forms of writing the references are as follows:

Journal:

- [1] J. Cruz-Mérida, G. Corro, F. Bañuelos, D. Montalvo, U. Pal. "Production of biodiesel from waste frying oil using waste calcareous-onyx as unique esterification and transesterification catalytic source". *Catal Commun*, vol. 172, no. 03, pp. 11,2022; <https://doi.org/10.1016/j.catcom.2022.106534>.
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Book:

- [4] P.M. Morse and H. Feshback, *Methods of Theoretical Physics*. New York: McGraw Hill, 1953.

Conference Proceedings:

- [5] R. Frinkel, R. Taylor, R. Bolles, R. Paul, "An overview of AL, programming system for automation," in *Proc. Fourth Int. Join Conf Artif. Intel.*, pp. 758-765, Sept. 3-7, 2006.