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| Book Name: | [Chemical and Materials Sciences: Developments and Innovations](https://www.bookpi.org/bookstore/product/chemical-and-materials-sciences-developments-and-innovations-vol-1/) |
| Manuscript Number: | **Ms\_BPR\_** **3636** |
| Title of the Manuscript:  | **Pre-Treatment and Characterization of Cathode Active Material from Spent Lithium-IoN Batteries** |
| Type of the Article | **Book chapter** |

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| PART 1: Review Comments |
| Compulsory REVISION comments | Reviewer’s comment | Author’s Feedback *(Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)* |
| **Please write a few sentences regarding the importance of this manuscript for the scientific community. Why do you like (or dislike) this manuscript? A minimum of 3-4 sentences may be required for this part.** | **This research is crucial for future works as it discusses how increasing use of lithium-ion batteries poses environmental and public health risks. The rising use of lithium-ion batteries poses ecological and public health risks due to hazardous metals in spent batteries. Recycling procedures are being developed to ensure long-term sustainability. This research focuses on efficient, affordable, and environmentally friendly recycling methods which are crucial for future work toward choosing appropriate methods to recycle our components and materials.** |  |
| **Is the title of the article suitable?****(If not please suggest an alternative title)** | **Yes, it is.** |  |
| Is the abstract of the article comprehensive? Do you suggest the addition (or deletion) of some points in this section? Please write your suggestions here. | **Yes, it is.** |  |
| **Are subsections and structure of the manuscript appropriate?** | **Subsections and structures are well organized. However, the last section number should be correct to 5.****5. Conclusion and Future Scope**  |  |
| **Please write a few sentences regarding the scientific correctness of this manuscript. Why do you think that this manuscript is scientifically robust and technically sound? A minimum of 3-4 sentences may be required for this part.** | **Although it is important as a book/Review for the scientific community. This book lacks a lot of information. The introduction section is poor and must be extended with more details on cathode materials for LIBs. The authors must use additional recent papers to improve the quality and technicity of this manuscript.** |  |
| **Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.****-** | **No. The reference provided is insufficient for this work. The authors are recommended to use and cite these additional recent papers to improve the quality and technicity of this manuscript.****[1] Theodore, A. M. (2023) Progress into lithium-ion battery research. Journal of Chemical Research 47(3):1-9. DOI: 10.1177/17475198231183349****[2] Theodore, A. M. (2023) A Comprehensive Analysis of Material Revolution to Evolution in Lithium-ion Battery Technology. Turk. J. Mater. 8(1): 1-13.****[3] Azemtsop Manfo, T., 2023. Development and Characterization of a New Solid Polymer Electrolyte for Supercapacitor Device. International Journal of Electrochemistry, 2023(1), p.4825624.****[4] Badi, N.; Theodore, A.M.; Alghamdi, S.A.; Al-Aoh, H.A.; Lakhouit, A.; Singh, P.K.; Norrrahim, M.N.F.; Nath, G. (2022) The Impact of Polymer Electrolyte Properties on Lithium-ion Batteries.Polymers, 14: 3101.** [**https://doi.org/10.3390/polym14153101**](https://doi.org/10.3390/polym14153101)**.****[5] Theodore A. M. (2023) PROMISING CATHODE MATERIALS FOR RECHARGEABLE LITHIUM-ION BATTERIES: A REVIEW. International Journal of Sustainable Energy and Environmental Research, 14(1):51-58.** **[6] Badi, N., Azemtsop, M. T.; Aashis, R.; Saleh, A.; Alghamdi, Ahmed O M. A.; Alex, I. (2022) Preparation and Characterization of 3D Porous Silicon Anode Material for Lithium-Ion Battery Application." International Journal of Electrochemical Science 17, 6: 22064.****[7] Manfo, T. A. Structural, electrical, and electrochemical studies of the olivine LiMPO4 (M=Fe, Co, Cr, Mn, V) as cathode materials for lithium-ion rechargeable batteries based on the intercalation principle [version 1; peer review: 1 approved with reservations, 3 not approved]. Materials Open Res 2023, 2:11 (**[**https://doi.org/10.12688/materialsopenres.17559.1**](https://doi.org/10.12688/materialsopenres.17559.1)**) Materials Open Res 2023, 2:11 (<https://doi.org/10.12688/materialsopenres.17559.1>)** **[8] Badi, Nacer, Azemtsop Manfo Theodore, Saleh A. Alghamdi, Hatem A. Al-Aoh, Abderrahim Lakhouit, Pramod K. Singh, Mohd Nor Faiz Norrrahim, and Gaurav Nath. "The impact of polymer electrolyte properties on lithium-ion batteries." Polymers 14, no. 15 (2022): 3101.****[9] Theodore, A.M. and Şahin, M.E. (2024) Modeling and simulation of a series and parallel battery pack model in MATLAB/Simulink. Turk J Electr Power Energy Syst, 4(1), 2-12, DOI: 10.5152/tepes.2024.23024****[10]Manfo, A.T., Singh, P.K., Mehra, R.M., Singh, R.C. and Gupta, M., Structural, Vibrational, Electrical, Electrochemical and Capacitive Investigations on Ionic Liquid Doped P (VDF-HFP)+ NaSCN Based Polymer Electrolytes.****[11] Theodore, A.M., Abbas, A.A. and Dhapola, P.S., 2023. Effect of Layered, Spinel, and Olivine-Based Positive Electrode Materials on Rechargeable Lithium-Ion Batteries: A Review. *JCMPS*, *6:* 38-57.****[12]Manfo, T.A. and Şahin, M.E. (2023). Intercalation reaction in lithium-ion battery: effect on cell characteristics. *The International Journal of Materials and Engineering Technology*, *6:* 70-78.****[13] Azemtsop Manfo, Theodore. "Development and Characterization of a New Solid Polymer Electrolyte for Supercapacitor Device." *International Journal of Electrochemistry* 2023, no. 1 (2023): 4825624.****[14] Azemtsop, T.M., 2024. Optical, vibrational, electrical, and electrochemical studies of new plasticized methylcellulose‐based solid polymer electrolytes for supercapacitor application. *Electrochemical Science Advances*, *4*(5), p.e2300018.****2. The is a lack of information on other components. The authors did not provide details on electrolytes, anode, and other materials used in lithium battery technology. The authors should also briefly discuss other materials and components than cathode and analyze their thermal and composition effect using the method used.****3. The authors should briefly define the TGA approach in the 3.5 section as they did with the XRF method in 3.6****4. The authors should improve the discussion on FTIR AND TGA. Please use and cite the following papers in the discussion and Results section in your manuscript.****[1]Konwar, S., Singh, P.K., Mehra, R.M., Kumar, Y. and Gupta, M., 2021. PEO+ NaSCN and ionic liquid-based polymer electrolyte for supercapacitor. *Materials Today: Proceedings*, *34*, pp.802-812.****[2]Manfo, A.T., Singh, P.K., Mehra, R.M., Singh, R.C. and Gupta, M., 2021. Structural, vibrational, electrical, electrochemical and capacitive investigations on ionic liquid doped P (VDF-HFP)+ NaSCN based polymer electrolytes. *Recent Innovations in Chemical Engineering (Formerly Recent Patents on Chemical Engineering)*, *14*(1), pp.21-34.****5. In section 4.2, the authors must provide the structural representation of a LIB cell with all the relevant components and materials** |  |
| Minor REVISION commentsIs the language/English quality of the article suitable for scholarly communications? | **Yes. However, the manuscript should be thoroughly checked to correct possible spelling mistakes.** |  |
| Optional/General comments | The manuscript entitled ‘Pre-Treatment and Characterization of Cathode Active Material from Spent Lithium-IoN Batteries’. The manuscript reads good and relevant for future work.However, major revision is required. I recommended the authors to revise their manuscript as suggested by the reviewer.  |  |

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| **PART 2:**  |
|  | **Reviewer’s comment** | **Author’s comment** *(if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)* |
| **Are there ethical issues in this manuscript?**  | *(If yes, Kindly please write down the ethical issues here in details)* |  |

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| **Reviewer Details:** |
| Name: | **Theodore Azemtsop Manfo** |
| Department, University & Country | **University of Vaasa, Finland** |