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| Book Name: | [**Chemical and Materials Sciences: Research Findings**](https://www.bookpi.org/bookstore/product/chemical-and-materials-sciences-research-findings-vol-1/) |
| Manuscript Number: | **Ms\_BPR\_4543** |
| Title of the Manuscript: | **Lignin-containing adhesion enhancer for wood-plastic composites** |
| Type of the Article | **BOOK CHAPTER** |

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| PART 1: Comments | | |
|  | Reviewer’s comment **Artificial Intelligence (AI) generated or assisted review comments are strictly prohibited during peer review.** | 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. A minimum of 3-4 sentences may be required for this part.** | This manuscript is of high importance to the scientific community, particularly in the fields of materials science and sustainable engineering. The study addresses critical challenges in improving the adhesion properties of wood-plastic composites, which is essential for enhancing their mechanical performance and durability. The innovative approach using lignin-based polyelectrolyte complexes aligns with the global push toward sustainable and biodegradable materials. Additionally, the findings have potential industrial applications in the production of eco-friendly composites, reducing reliance on synthetic coupling agents. |  |
| **Is the title of the article suitable?**  **(If not please suggest an alternative title)** | The title accurately reflects the content of the manuscript |  |
| 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. | The abstract is comprehensive and provides a clear summary of the study. However, it could benefit from a brief mention of the key quantitative improvements observed in adhesion and mechanical properties. Additionally, specifying the industrial relevance of the findings in the abstract would enhance its impact. |  |
| **Is the manuscript scientifically, correct? Please write here.** | The manuscript is scientifically sound, and the experiments are well-executed. The methodology is rigorous, and the results support the conclusions drawn. The discussion effectively relates the findings to previous studies, demonstrating their validity. No major scientific inaccuracies were noted. |  |
| **Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.**  **-** | The references are generally sufficient and cover relevant prior work. However, it would be beneficial to include more recent studies (from the last 3-5 years) on lignin-based adhesion enhancers and wood-plastic composite modifications. |  |
| Is the language/English quality of the article suitable for scholarly communications? | The manuscript is well-written and adheres to academic language standards. However, minor grammatical refinements and simplifications in some complex sentences could improve readability. Proofreading for minor typos and structural clarity is recommended to ensure smooth scholarly communication. |  |
| Optional/General comments | The manuscript presents a comprehensive study on the use of lignin-containing polyelectrolyte complex (LPEC) nanoparticles as an adhesion enhancer in wood-plastic composites (WPCs). The research is well-structured, thoroughly executed, and contributes significantly to the field of sustainable materials. The study is relevant, methodologically sound, and provides valuable insights into adhesion mechanisms and material performance enhancement.  **Areas for Improvement**  **Clarity and Readability:**  Some sections, particularly in the Introduction and Results and Discussion, contain long and complex sentences that may reduce readability. Consider breaking these into shorter, clearer statements.  Example: The explanation of polyelectrolyte complexation and its interactions (p. 4) could be simplified for better comprehension.  Consistency in Terminology and Units:  Ensure consistency in the use of terms such as "adhesion enhancer" and "coupling agent" throughout the manuscript.  Verify that all units (e.g., %, kDa, MPa) are consistently formatted according to journal guidelines.  **Experimental Section:**  Provide additional details on the reproducibility of experiments (e.g., number of replicates for each test).  Clarify the justification for selecting specific reaction conditions for LPEC synthesis (pH, mixing ratios, etc.).  **Figures and Graphs:**  Some figures (e.g., UV spectra in Fig. 2) could benefit from higher resolution for better clarity.  Consider adding scale bars to SEM images (Fig. 6) for better comparison.  **Discussion on Environmental Impact:**  While the study highlights the sustainable aspects of lignin-based adhesion enhancers, a brief discussion on biodegradability and potential recycling benefits of LPEC-treated WPCs would strengthen the manuscript’s impact.  **Conclusion Section:**  The conclusion effectively summarizes the key findings but could benefit from a concise statement on the broader implications of this work for industrial applications and future research directions.  **Recommendation**  The manuscript is highly suitable for publication in a reputed journal with minor revisions to improve clarity, consistency, and depth in discussion.  Addressing the suggested improvements will further enhance the readability and impact of the study. |  |

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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:** | |
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