

# Review of: "Impact of Starch Concentration on Chlorella-k-Carrageenan Gel Formation Mechanism"

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**Potential competing interests:** No potential competing interests to declare.

This study focuses on alternatives to plastic packaging, which employ microalgae and starch-based materials. The gel formation mechanisms are investigated using photometric analyses, namely photon transmission and absorbing techniques. This is an impactful study that needs revision before publication. The points are given below.

1. The current title does not accurately represent the depth and breadth of the study. A more focused title that succinctly captures the study's objective and application is essential for a comprehensive understanding of the research.
2. The literature review section is too short, and the literature is not up to date. Authors should incorporate more recent studies and references to provide an updated perspective on the use of microalgae and starch in biodegradable packaging.
3. The authors should clearly mention the specific gap in existing research that this study addresses. This could be a separate paragraph that highlights why this study is necessary.
4. The study mentions using commercially available Chlorella, but verifying its purity is crucial. The presence of impurities could significantly impact the results, so it's essential to ensure the validity and credibility of the study's findings.
5. Experimental conditions such as precise temperature control and stirring rates, crucial for reproducibility, are not detailed controlled. Authors should define and maintain consistent experimental conditions, including temperature control, stirring rates, and precise measurement techniques.
6. The study does not mention the number of replicates for each experiment or provide statistical analysis of the results, making it difficult to assess the reliability of the findings. The author should add replicates and provide statistical analysis to validate the reproducibility and significance of the results.
7. The study only explores a few specific Chlorella, starch, and NaCl ratios. A broader range of concentrations could provide a more comprehensive understanding of the gel formation mechanism.
8. The temperature ranges for the heating and cooling phases are not consistently defined or controlled, which could lead to variability in gel formation. Authors should establish and adhere to precise temperature protocols for the heating and cooling phases and use precise temperature monitoring and control systems.
9. The study focuses on photometric analyses but does not assess the gels' rheological properties (e.g., viscosity and elasticity), which are critical for their potential application in packaging.
10. Expand the discussion section to include a more detailed analysis of the potential practical applications and limitations of the gels formed in this study.
11. The interpretation of absorbance and transmittance data is vague and lacks clarity. The discussion should provide

more insights into what these measurements imply about the gel formation process.

12. Discuss the environmental and economic implications of using *Chlorella-k-Carrageenan-starch* gels as alternatives to plastic packaging.
13. Ensure consistency in the units and measurements used throughout the manuscript for clarity and ease of comparison.
14. The author should summarize the key findings succinctly, focusing on the most important results and their implications. The conclusion could be strengthened by suggesting specific areas for future research. This would demonstrate awareness of the study's limitations and guide further investigation.