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# Thermal Study of Styrene-butadiene Composites with *Arthrospira Platensis* Biomass

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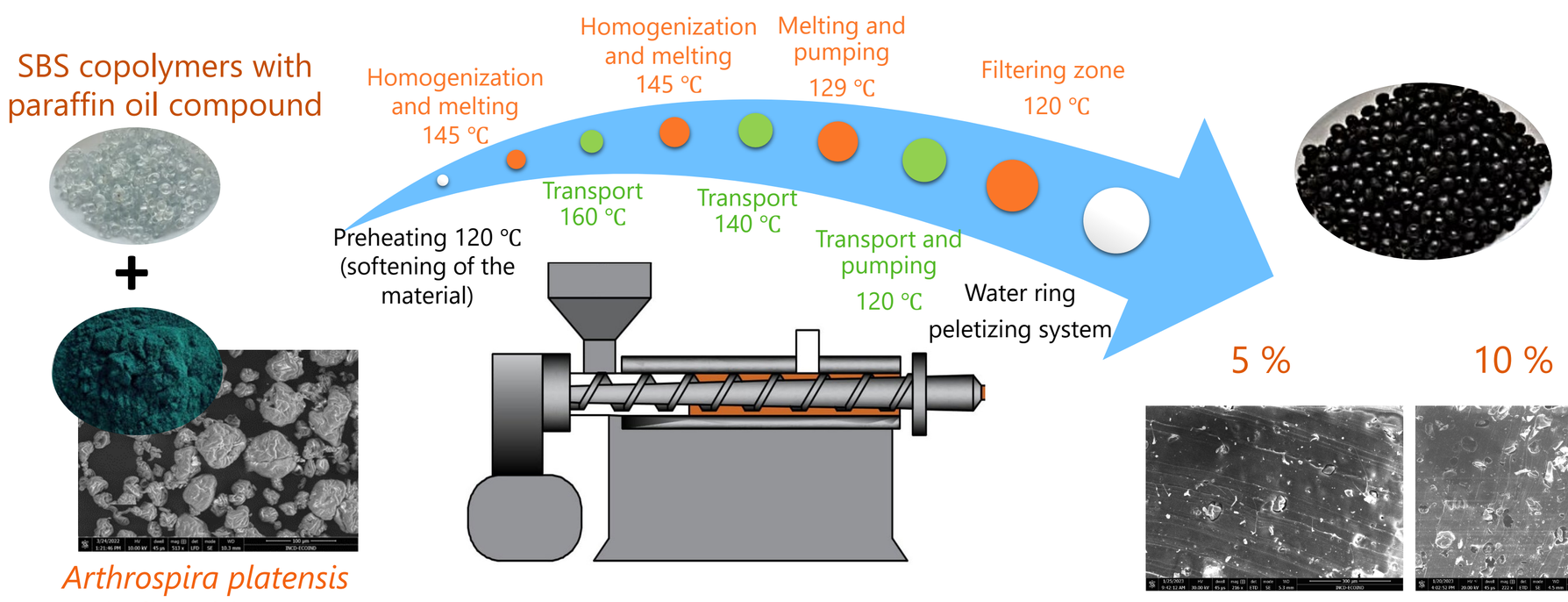
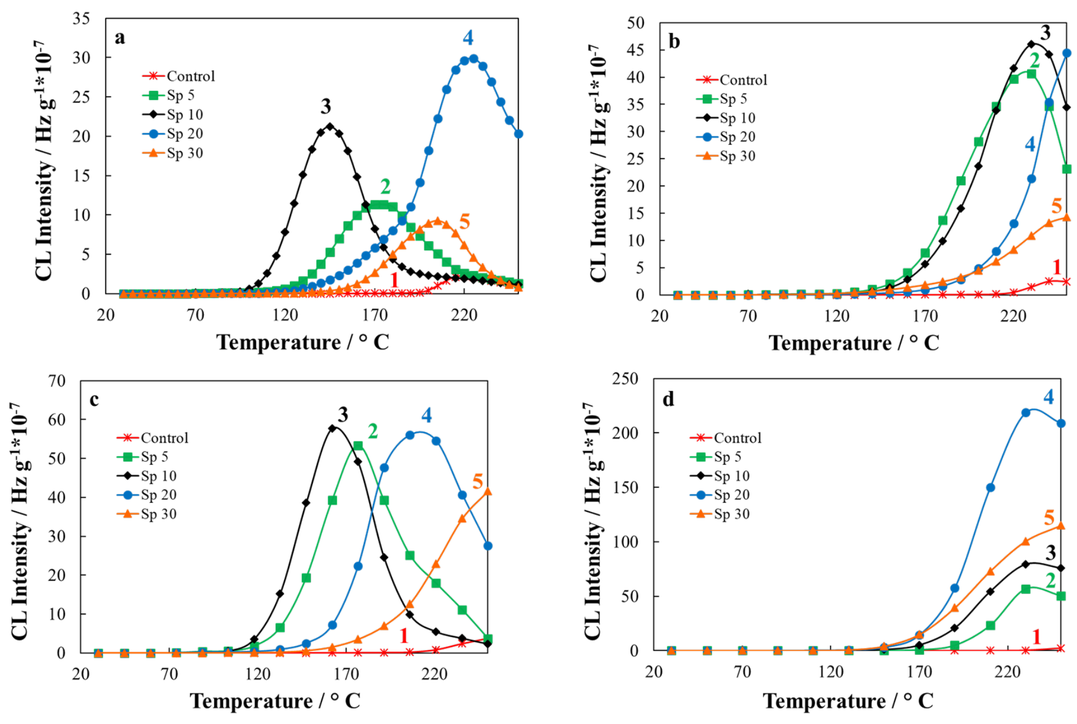
## Introduction

Spirulina (*Arthrospira platensis*) is as a promising candidate for augmenting the biodegradability of polymer materials. This cyanobacteria often denoted as blue-green algae, has gained attention due to its diverse potential applications. Notably, it can serve as a biomass filler in the production of biodegradable polymers alongside natural rubber, ethylene propylene diene monomer rubber (EPDM), polylactic acid (PLA), poly(butylene succinate) (PBS), polyvinyl alcohol (PVA), and polypropylene (PP). The composition of *Arthrospira platensis* biomass primarily comprises mainly carbohydrates, lipids, proteins, and pigments. Considering these numbers, spirulina exhibits good promise as a high-protein content biomass filler for the development of biodegradable polymer materials. Thus, contributions to aligning with the objectives related to mitigation of the environmental impact of plastics and advancing to sustainable alternatives. Nevertheless, several factors must be carefully considered to successfully integrate Spirulina biomass into polymer materials. These include selecting appropriate processing methods that provide compatibility of the bio-filler with the polymer matrix and optimizing the Spirulina content to achieve the desired properties without compromising the overall performance of the composite material. This study aimed to evaluate the thermal behavior of polymer composites incorporating Spirulina biomass in different mass ratios.

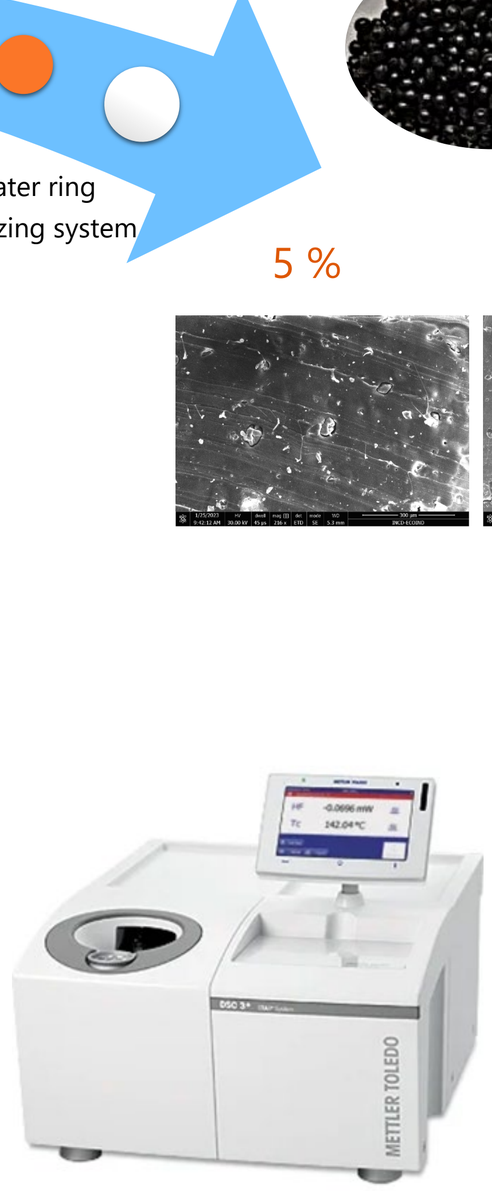
## Manufacturing of polymer composites with incorporated algal biomass

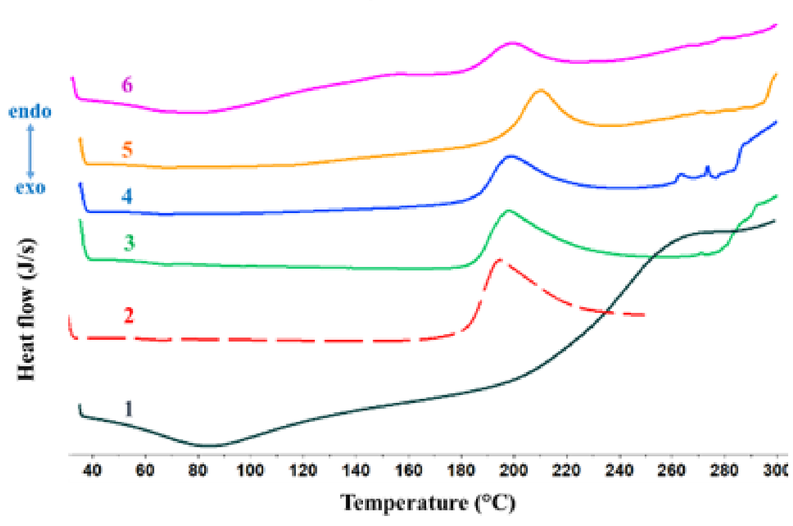



## Nonisothermal CL spectra recoded




## DSC comparative curves




1 – *Arthrospira platensis* powder, and SBS composite with: 2 – 0 %, 3 – 5 %, 4 –10 %, 5 – 20 %, and 6 – 20 % *Arthrospira platensis* biomass (w/w)

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