

Thermo-Chemical Extraction of Sugars from *Chlorella pyrenoidosa*

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Microalgae have recently been considered as the most promising renewable feedstock for biorefineries. In this study, *Chlorella pyrenoidosa* was selected and utilized for microalgal biomass as feedstock of fermentable sugar production. For the sugar extraction from microalgae-based carbohydrates, thermo-chemical treatment was applied and the effective reagent was screened for the extraction. As a result, dilute sulfuric acid was significantly efficient among the three reagents (H<sub>2</sub>O, NaOH and H<sub>2</sub>SO<sub>4</sub>). Based on dilute sulfuric acid treatment, the optimal conditions for sugar extraction were investigated by statistical method. The three major factors (solid/liquid ratio, acid concentration and reaction time) were considered and optimized. The factors for optimal condition were as follows: reaction time 38.02 min, solid/liquid ratio 100 g/L and acid concentration 3%. The determination coefficients (R<sup>2</sup>) of the glucose and galactose were 0.8726 and 0.8675. The coefficients of variance were 28.37% and 24.33%, respectively. Finally, the sugars were recovered at a rate of about 90% from *C. pyrenoidosa* under the optimal conditions.