

Sequential acid and enzymatic hydrolysis of carrageenan solid waste for bioethanol production: a biorefinery approach

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Abstract	The seaweed industry has developed rapidly over the last decade, and carrageenan is the leading hydrocolloid in the seaweed industry. Approximately 57,500 t of carrageenan is produced annually throughout the world. As a consequence of the increase in carrageenan production, the enormous amount of waste resulting from the carrageenan industry has also increased. This study investigated the possibility of ethanol production using carrageenan solid waste from the carrageenan extraction of <i>Kappaphycus alvarezii</i> , the principal species used in the carrageenan industry. Optimum acid hydrolysis followed by enzymatic hydrolysis enhanced the production of both galactose and glucose. Fermentation of the enzymatic hydrolysate using <i>Saccharomyces cerevisiae</i> ATCC 200062 resulted in an ethanol yield of 13.8 g L ⁻¹ .
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