

Solid–liquid mass transfer coefficients in an ultrasound-irradiated extraction of iota-carrageenan

Abstract

A 20-kHz intensity ultrasound was used in the extraction of iota-carrageenan from *Eucheuma denticulatum* seaweed by using water as solvent. In a simplified extraction procedure, the seaweed particle size of 0.7125E-03 m, 1.2E-3 m, and 1.7E-03 m diameter were studied at different ultrasonic amplitude levels, ranging from 2.08E-06 to 6.4E-06 m and the temperatures from 30 to 60 °C. The maximum iota-carrageenan yield obtained was 57.2 %. This study suggested that ultrasound intensity employed reduced the extraction time required and improved the yield of iota-carrageenan by 6 %. The particle diameter variation during the extraction was found to be a linear equation. The solid-liquid mass transfer coefficient was correlated for ultrasound extraction of iota-carrageenan in terms of operating conditions employed in this investigation as $k_L = 0.0027A^{0.866}D_p^{-0.533}(T)^{0.133}$.