

Depolymerization of Chitosan Using a High Pressure Homogenizer

조준희*, 김태영, 윤혜연, 김현효

(주)일신오토클레이브

(jhcho@suflex.com*)

The chitosan extracted from crustacean shells is a biocompatible, biodegradable and non-toxic polymer, which makes it attractive for applications in the medical, pharmaceutical, cosmetic and food industries. However, large molecular weight and viscosity limits its applications. Large molecular weight chitosan was depolymerized by a high pressure homogenizer (Nano Dispenser, ILSHIN AUTOCLAVE) with a micro orifice module. 1% (w/v) chitosan solution was prepared with 1%(v/v) acetic acid solution. The chitosan solution was passed through a high pressure homogenizer at 500 to 1500 bar for 1 to 5 cycles. An increase in the pressure and the number of passes causes the viscosity and molecular weight to decrease without the use of any additives, such as acid/alkali solutions. The FT-IR spectra indicated no obvious modifications of the chemical structure of chitosan before and after the high pressure homogenizer treatment. The UV spectra showed a new absorption band of carbonyl groups at 255 nm. The carbonyl groups might be formed during depolymerization. The depolymerization of chitosan using a high pressure homogenizer is a green chemical process for potential medicine, pharmacy and food industries applications.