

Application of ultrasonic waves coupled with functional link neural network for estimation of carrageenan concentration

Abstract

In this paper, a simple functional link neural network (FLNN) model is developed for the quantification of polysaccharides using ultrasonic waves. Every material has its own intensity to absorb the sound waves. The sound absorption capability of Carrageenan is based on its concentration in the solution. The sound pressure level obtained from the one third octave band frequency spectrum is given as input to the FLNN and the carrageenan concentration is estimated as output. Two simple modifications in the architectures of FLNN are newly proposed and its performances are compared with the conventional FLNN method. In the first architecture, a hidden layer is newly introduced in a FLNN and trained by Error Back Propagation (EBP) procedure. In the second architecture, the Functional Link concept is extended to the neuron in the hidden layer and the network is trained by EBP procedure. The proposed procedure has minimized the training time as well as the number of failures. © 2008 Academic Journals.