

Surface tension of viscous biopolymer solutions measured using the du Nouy ring method and the drop weight methods

Abstract

The discrepancy of the existing literature data on the surface tension values of biopolymer solutions could be affected by the measurement technique. The aim of the study was to compare the surface tension values of biopolymer solutions, measured using the du Nouy ring method and the drop weight methods (Harkins-Brown correction factors method and the LCP coefficient method). Four biopolymers were chosen (sodium alginate, carboxymethyl cellulose, xanthan gum and pectin) and the surface tensions of the solutions were measured as a function of biopolymer concentration. The surface tension was found to increase with biopolymer concentration when measured using the du Nouy ring method. On the other hand, the drop weight methods gave an opposite trend. The results verified the discrepancy of the existing literature data. The error may be caused by the correction factors calculation and the solution viscosity when the du Nouy ring method was used. The LCP coefficient method which is independent of correction factors and liquid properties is proposed for measurement of the surface tension of viscous biopolymer solutions.