STUDIES ONMOISTURE ADSORPTION CAPACITY AND ISOTHERM ANALYSIS OF XANTHAN GUM

N.Sivarajasekar*[1], S. Sivamani[2]
[1]Department of Chemical Engineering, Kongu Engineering College, Erode 638052, TN
[2]Department of Biotechnology, Kumaraguru College of Technology, Coimbatore 641049, TN
*Corresponding Author: E-mail: sivarajasekar@gmail.com ; Ph: +91 9597436327

Abstract

Xanthan gum is a hydrophilic polymer, produced by the microorganism *Xanthamonas Campestris*. Moisture adsorption isotherms of Xanthan cum were determined at 30, 40 and 50°C using gravimetric method. The sorption data were fitted to four well known sorption isotherm models (Langmuir, Freundlich, Redlich-Peterson and Toth) using non-linear least square method. The Redlich-Peterson model was found the most satisfactory for representation of the equilibrium moisture content data for Xanthan cum. The equilibrium moisture content of Xanthan cum was found to be significant. The isosteric heat of sorption was determined from the equilibrium moisture adsorption data using Clausius-Clapeyron type equation. Exponential relationship described well the dependence of isosteric heat of sorption on the equilibrium moisture content. The enthalpy-entropy compensation theory applied to sorption isotherms indicated enthalpy controlled sorption process.

Keywords: Xanthan cum, water adsorption, isotherm, thermodynamics