



International Journal of Advanced Research in Biology, Ecology, Science and Technology (IJARBEST)
Vol. 2, Special Issue 8, February 2016 in association with
KAMARAJ COLLEGE OF ENGINEERING AND TECHNOLOGY, VIRUDHUNAGAR
DEPARTMENT OF BIOTECHNOLOGY

ORGANIZES

DBT, NEW DELHI SPONSORED NATIONAL LEVEL CONFERENCE ON CONTEMPORARY TRENDS IN
BIOENERGY AND GREEN TECHNOLOGY: CHALLENGES AND OPPORTUNITIES [ORA-2016]
(25-26TH FEBRUARY 2016)

STUDIES ON MOISTURE ADSORPTION CAPACITY AND ISOTHERM ANALYSIS OF XANTHAN GUM

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Abstract

Xanthan gum is a hydrophilic polymer, produced by the microorganism *Xanthomonas Campestris*. Moisture adsorption isotherms of Xanthan gum 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 gum. The equilibrium moisture content of Xanthan gum 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 gum, water adsorption, isotherm, thermodynamics

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