

Analysis of low-temperature impact supramolecular structure and adsorption properties of cellulose

© Tatiana Yu. Grunina,¹ Daria S. Masas,²⁺ Nadeshda N. Sheveleva,²
Vladimir I. Talantsev,² and Yury B. Grunin^{2*}

¹ Volga State Technology University. Sq. Lenin, 3. Yoshkar-Ola, 424000. Russia.

Phone: +7 (8362) 68-68-64. E-mail: GruninYB@volgatech.net

² Moscow State University named after M.V. Lomonosov. Lenin Hills, 1. Moscow, 119991. Russia.

Phone: +7 (495) 939-10-00.

Keywords: ¹H NMR, system biopolymer-water, cellulose, Gibbs adsorption layer, the interfacial boundary between the chemical potential, the surface tension.

Abstract

The possibility of ¹H NMR pulse method for the study of phenomena at the interface biopolymer-water were showed in the framework of the Gibbs adsorption theory. The mathematical expression relating the nuclear magnetic relaxation times with the chemical potential and the surface tension at the interface in the system biopolymer-water are presented. During the formation of a layer of Gibbs in different samples of cellulose discovered the nature of changes in thermodynamic and relaxation parameters. The state of water in the adsorption layer with the definition of its average size were investigated.