

Nanostructure of cellulose microfibrils

© Yury B. Grunin,^{*+} Leonid Y. Grunin, Vladimir I. Talantsev,

Darya S. Masas, Ekaterina A. Nikolskaya, and Osman M. Aslan

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

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

^{*}Supervising author; ⁺Corresponding author

Keywords: biosynthesis, cellulose, microfibril, hydrogen bond, nuclear magnetic resonance.

Abstract

The analysis of the current ideas about structural organization and nature of the cellulose microfibrils in the formation of its biosynthesis has been carried out. A model of the structure of cellulose microfibrils, providing availability of slit-shaped micropores in its structure has been offered. Basing on experimental studies of sorption processes with the use of proton magnetic relaxation we found that at the cellulose moisture content of 8-10%, its micropores are filled, which is accompanied by increasing their cross-sectional dimension, by increasing surface area and decreasing the degree of crystallinity of the samples.