

Dielectric relaxation of water absorbed in porous glass

Ryabov Y., Gutina A., Arkhipov V., Feldman Y.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

The dielectric spectroscopy method was applied to the investigation of water absorbed on the inner surface of porous glass. The measurements were done using broad band dielectric spectrometry (BEDS) over a wide range of frequency (20 Hz to 1 MHz) and temperature (-100 °C to +300 °C). The dielectric response was found to be very sensitive to the geometrical micro- and mesostructural features of the porous matrix and the structure and mobility of the water filling the pores. The hindered dynamics of water molecules located within the pores and affected by the surfaces reflect the geometrical structure of the porous matrix. The analysis of the dielectric parameters as a function of the temperature enabled us to characterize the physical parameters of the dielectric spectra over an extended frequency range. © 2001 American Chemical Society.
