

Water retention by active carbon fibres obtained from viscose

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Abstract

The work presented in this paper concerns an investigation we have carried out into the water retention ability of activated carbon nonwovens manufactured from cellulose fibres. The precursor nonwovens manufactured by the spun-laced method were pyrolysed and carbonised at temperatures of 400°C, 600°C, and 800°C, and next activated at the temperature of 850°C. The kinetic curves of water sorption and the absorption parameters were assessed. The properties of the microporous structure of the fibres were determined on the basis of the nitrogen sorption isotherm. The activated nonwovens were characterised by an active internal surface of over 1000 m²/g. As the result of activation, the water absorption increased by over 2.5 times when compared with the absorption of precursor nonwovens. The tests carried out allowed us to state that water retention mainly depends on the physical and the chemical properties of the carbon surface, as well as on the content of great pores in the porous structure of the fibres. In turn, the surface properties depend on the processing temperature.

Keywords: water retention, absorption, carbon fibres, active carbon, precursor viscose, precursor nonwovens

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