

Thermodynamic study of cellulose containing oxides

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Abstract

At present, the works reserved to cellulose for the development of micro / nano composites (MNC) are becoming relevant and taking a prominent place in several laboratories. The perspectives are numerous electronics, paper 3D printing technology, medical and development of environmentally friendly absorbent systems.

The aim of this work is the thermodynamic study of cellulose containing different concentrations of oxides. The dilatometric measures show that the thermal expansion coefficient curves of MNC studied have the same shape. Every curve contains a negative thermal expansion. The temperature of onset of the peak dependent on the quantity of oxide introduced into the matrix. When the concentration increases, the apparition temperature moves within high temperatures area. The differential scanning calorimetry shows that the curves are superimposable but the different intensities of an MNC to another. The thermogravimetry differs from one sample to another. For the nanomaterial containing an important quantity of oxide, the weight loss is smallest. When the oxide concentrations increase in the matrix, the thermogravimetry decreases.

Keywords: Cellulose, MNC, oxides, absorbent, thermogravimetry, Dilatometry