

BIODEGRADABLE NANOCOMPOSITES BASED ON CELLULOSE WITH NA-MONTMORILLONITE

I.S. Makarov¹, L.K. Golova¹, A.V. Rebrov¹, E.V. Matukhina², V.G. Kulichikhin¹

1 - A.V.Topchiev Institute of Petrochemical Synthesis, Russian Academy of Sciences
2 - Moscow State Pedagogical University

rus9906@rambler.ru

Biodegradable nanocomposites based on cellulose with modified Na-montmorillonite were obtained through the solid phase dissolution of cellulose in N-methylmorpholine-N-oxide (MMO).

The rheological study of 18% solutions of cellulose in MMO with micro-and nanoparticles of Na-montmorillonite showed that the addition of 0.1% clay nanoparticles in contrast of micro-particles leads to the significant reduction in viscosity.

Addition of clay to cellulose allows us to control the cellulose structure formation, seizing it on the 2D mesophase formation.

The novel nanostructured compositions based on the cellulose/clay systems possess high mechanical properties exceeding the strength and modulus values of native cellulose by 1.5-2 times.