Managing the process of polymeric materials based on new types of cellulose nitrates

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Abstract

When developing new formulations based on cellulose nitrate (NC), their solutions must meet the specified parameters of viscosity and transparency, herefore of particular importance are the questions received NC with controlled rheological properties. The most complex technological challenge is to ensure stable parameters of viscosity solutions NC (N = 10.9-11.2%) within a narrow range (6.4-10.4 mPa•s) at a high degree of transparency solutions.

Existing mathematical models describe the rheological behavior of the processes of the flow of concentrated solutions of cellulose nitrate and is not adequate to calculate the rheological properties of dilute solutions.

We have developed a mathematical model of the rheological behavior of dilute solutions of NC and formation of the structural parameters using experimental data. As a method of solution by the method of multiple regression.

It is shown that when resizing and arrangement of elements of supramolecular structure and fractional composition significantly change the properties of solutions of NC.

The resulting mathematical model can predict the rheological behavior of solutions of NC, depending on the nature of the polymer and solvent, and predict the properties obtained from these compositions.