

The flow index as a universal indicator for assessing the plastic properties of polymer compositions

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Keywords: flow index, flow coefficient, nitrocellulose composition, polymer composition, Vasiliev balance cone.

Abstract

The analysis of methods for determination the liquidity index of polymer compounds was carried out. A method for determination masses plasticity by liquidity index which is determined by Vasiliev's standardized cone with apex angle of 300 is offering. The equations for liquidity index determination for polymer compounds based on cellulose nitrate and PVB are calculated on the Vasiliev's standardized cone with weight of 76.0 and 54.3 g. The regression equation was obtained. It allows calculating liquidity index value of polymer compounds from the known liquidity coefficient value which is obtained by capillary viscometry method with error that doesn't exceed $\pm 4\%$. The liquidity index applicability for plastic properties evaluating of polymer compounds with different components which are obtained by various methods is shown. It has been established that liquidity index determination by laboratory penetration method on the Vasiliev's standardized cone is less labor consuming in comparing with known hardware-calculation methods (pressure ball method, capillary viscometry method). The laboratory penetration method has technological labor consuming approximately in 3.4 times lesser than pressure ball method and approximately in 4 times lesser than capillary viscometry method in polymer masses plasticity determination by liquidity index.

It should be noted that penetration method for liquidity index determination on the Vasiliev's standardized cone is suitable only for concentrated polymer compounds (40.0 52.6 % of concentration) which processed by extrusion technology. This value can be determined on the Heppler viscometer with pressure ball for low viscosity CN lacquers which used in SP technology.

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