RESEARCH OF THE PROCESSES OF CURING OF MULTIFUNCTIONAL COMPOSITES BASED ON ORTHOPHTHAL POLYESTER OLIGOMERS FILLED BY HUMIN SUBSTANCES AND GLASS FIBER

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The work investigates the processes of curing of multifunctional polymer composites based on orthophthalic polyester oligomers modified with humic substances and reinforced with glass fiber. The relevance of the study is due to the need to create materials with increased performance properties, in particular strength, chemical resistance and controlled curing kinetics. The aim of the work is to establish the influence of the composition, initiator concentration and temperature conditions on the gelation rate and duration of the curing process. A viscometer with a dynamic viscosity measurement range from 0 to 5000 mPa·s was used for the study. It has been experimentally shown that the use of the PROMOX P200TX initiator provides an expansion of the technological window by extending the gel-like state of the compositions, which contributes to the effective impregnation of fillers. It has been established that humic substances, due to the presence of functional groups, affect the curing kinetics and the formation of the supramolecular curing of the polymer matrix, while glass fiber forms a reinforcing frame and provides high mechanical characteristics. Digital monitoring of exothermic effects of the curing process was carried out, which allowed to determine the optimal technological parameters of composites formation. The results obtained confirm the possibility of controlled formation of the curing and properties of composite materials by varying the composition and processing conditions. The developed approaches can be used to create polymer materials for curing and engineering purposes with a given set of physical and mechanical properties.

Keywords: polyester composites, humic substances, glass fiber, gelation, curing, hardening kinetics, polymer modification, composite materials.

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