TEMPERATURE DEPENDENT BEHAVIOUR OF AQUEOUS SOLUTIONS OF ETYLENEOXIDE AND PROPYLENEOXIDE BLOCK-COPOLYMERS AND ITS APPLICATION FOR INTERFACE SURFACE MODIFICATION IN DISPERSED SYSTEMS

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In this study, thermosensitive properties of water solutions of ethyleneoxide and propyleneoxide block-copolymers and possibility of their temperature controlled interaction with interface surface were investigated. An unusual character of phase decomposition at temperature decrease for diluted solutions was found. It was discovered that at temperature decrease, two-phase system crosses the binodal curve and becomes homogeneous and then, at further temperature decrease, crosses the binodal curve again and again the two-phase system occurs.

According to data obtained, phase diagram of block-copolymer – water system was plotted. It was established that diagram with lower critical solution temperature has a specific shape with small "siecle-like" part in the field of diluted solutions. Similar diagrams are described for the first time. The structure model of block-copolymers aqueous solutions has been proposed taking into account conformation changes of central blocks of copolymers.

On the basis of data about phase separation of these copolymer solutions, the temperature controlled copolymer precipitation for interface modification was investigated by electrokinetic sound amplitude method. Atomic force microscopy allowed to establish that thermoprecipitation of copolymers by intensive mechanical treatment results in formation of specific nanorelief of a polymer layer. The method of functionalization and subsequent crosslinking of thermosensitive copolymers was developed as well as method of surface modification by filled polymer systems consisting from thermosensitive polymer and dispersed nanoparticles.