

**THE INFLUENCE OF POLYMER STRUCTURE ON THERMOCHEMICAL PARAMETERS OF FORMATION MICELLES AND GELS***Rakipov I.T., Titova E.A., Petrov A.A., Akhmediyarov A.A., Solomonov B.N.*

Kazan Federal University

420008, Kazan, Kremlyovskaya st., 18

It is known that a significant part of the developed drugs are poorly soluble in aqueous systems, which affects their biological activity and stability. Polymers that are capable of self-organization in aqueous solutions with the formation of supramolecular aggregates (micelles) with medicinal preparations are used as systems to compensate for these disadvantages. At the same time, the thermodynamic parameters of micelles and gels influence the effectiveness of drug delivery.

In this work, a series of block copolymers (P123, F127, L64, F108) were selected as model compounds for studying the process of micelle and gels formation by calorimetry of dissolution and rheology. The enthalpies of dissolution of block copolymer solutions (P123, F127) in water with their different contents were determined by titration calorimetry of dissolution at  $T=298.15$  and  $P=101.3$  kPa. Methods for estimating the enthalpy of micelle formation and the critical concentration of micelle formation (CCM) for block copolymer solutions under standard conditions are proposed. The features of aggregate formation for polymer solutions are shown, and the differences between block copolymers P 123 and F 127 are discussed.

The role of the concentration of polymers (P123, F127) in the solution on the thermochemical parameters, as well as on the sizes of the aggregates formed in the solution, was established using the dynamic light scattering (DLS) method.

The role of the inclusion of the drug curcumin on the thermochemical and structural parameters of micelles is shown. The role of drug interactions with micelles in block copolymer solutions was discussed.

On the other hand, with increasing concentration of block copolymers in aqueous solutions, they are capable of forming gels. The role of polymer structure on the temperature and thermochemical parameters of gel formation was studied using the rheology method. The influence of hydrophobic-hydrophilic fragments in polymers on the studied parameters is shown. The possibility of controlling the thermal parameters of gelation due to inclusions has been revealed. A comparison of the studied parameters for micelles and gels for block copolymer solutions was carried out.

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