

ABSTRACT

Theoretical part of this thesis deals with nanoparticles, their preparation and utilization. It briefly summarizes microrheological methods, especially DLS. It describes hypromellose (HPMC), its properties and utilization in pharmacy.

In the experimental part of the thesis a method of dynamic light scattering (DLS) was used to assess diffusion coefficients of particles sized 20 nm, 60 nm, and 100 nm in dispersion medium of colloid solutions of HPMC. These were studied: polymers O₁, O₂, O₃ and O₄ in concentration 0,5%, 0,25%, 0,125%, 0,0625% and 0,03125%. Relative nanoviscosity η_{n-rel} of individual samples which was based upon values of diffusion coefficient D_i measured by DLS was compared with relative macroviscosity η_{rel} assigned upon results measured by capillary viscosimetry.

Relative nanoviscosity η_{n-rel} is more significant than relative macroviscosity η_{rel} for the behavior of polystyrene particles of used sizes in dispersion medium of colloid solutions of HPMC. Relative nanoviscosity η_{n-rel} is changing depending on used dispersion medium and size of nanoparticles.

Key words: nanoparticles, DLS, hypromellose, relative (macro-)viscosity, relative nanoviscosity.