CONFORMATIONAL AND OPTICAL MACROMOLECULAR PROPERTIES OF POLY (HEXYL METHACRYLATE) AND POLY (STEARYL METHACRYLATE)

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The study of various comb-like polymers remains an actual direction in the development of modern chemistry and physical chemistry of high-molecular compounds. The variations of radicals' structures can result in significant changes in the conformational and physical characteristics of the macromolecules.

The aim of the present work is to study the influence of the aliphatic side chains size on optical and conformational characteristics of poly (hexyl methacrylate) (HMA) and poly (stearyl methacrylate) (SMA), obtained by RAFT-polymerization. Certain number of the studied samples were investigated in dilute solutions in organic solvents (hexane and benzene). The detailed analysis was performed by classical self-consistent hydrodynamic approach using following experimental techniques: velocity sedimentation, dynamic light scattering, viscometry, densitometry, flow birefringence and equilibrium and non-equilibrium electric birefringence (Kerr effect) in dilute solutions.

The Mark-Kuhn-Houwink-Sakurada equations were received. The equilibrium rigidity and polymer chain diameter were defined using Gray-Bloomfield-Hearst extrapolation procedures. The values of the intrinsic optical anisotropy of the segment for both HMA and SMA were determined using the flow birefringence method. The molecular masses of the studied samples were calculated using the Svedberg equation. Based on the received data optical and conformational properties of HMA and SMA were compared. The determined characteristics compliment the data of previously investigated aliphatic poly (alkyl methacrylates).

References:

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