BOOK OF ABSTRACT

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Synthesis, Fractionation, Hydrodynamic Analysis of Hyperbranched Pyridylphenylene Polymers and Iron Oxide Nanocomposites on their Basis

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The growing interest of world wide research community in engineering and introduction of magnetic nanoparticles (NPs) is observed in recent years. This is explained by their numerous applications in a wide range of fields (technological, medical, pharmaceutical etc.). The following “cutting edge” applications of magnetic NPs could be pointed out as high density storage devices, magnetic biosensors, contrast agents for NMR studies. Guided by the stated above the task of synthesis and studying the properties of iron oxide composites on the basis of the hyperbranched pyridylphenylene polymers is extremely important.The efficient and facile A6 + B2 approach has been proposed to synthesizing of hyperbranched pyridylphenylene polymers (HBPPP) using Diels-Alder polycycloaddition of the first-generation, six-functional pyridine-phenylene dendrimer (A6) and the aromatic bis(cyclopenta-dienone)s (B2).[1, 2] The synthesized HBPPP samples were studied in present work and further used for synthesis of irone oxide nanocomposites. The conformational characteristics were obtained for initial polymers and synthesized nanocomposites. The study has been accomplished using the unique combination of molecular hydrodynamics methods. On the basis of hydrodynamic data the conclusions on conformational parameters were formulated. The presence of the largest range of hydrodynamic sizes is found for a nanocomposite solution associated with macromolecules, inndividual nanoparticles and nanoparticle clusters. The fractionation of initial polymers have been acomplished by means of fractional precipitation method in THF solutions with use of hexane as precipitant.

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