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Faculty of Technology and Metallurgy
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8th International Conference
of the Chemical Societies
of the South-East European Countries

BOOK OF ABSTRACTS

organized by

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UCB - Union of Chemists in Bulgaria
PUC - Pancyprian Union of Chemists
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Optical and structural characterization of silver/polystyrene nanocomposites by *in-situ* bulk radical polymerization

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Nanocomposites (NCs) with different amount of silver nanoparticles (Ag NPs) embedded in polystyrene (PS) matrix were prepared by *in situ* radical polymerization. In order to achieve homogeneous distribution of Ag NPs in the PS matrix, the nearly monodisperse Ag NPs (7.0 ± 1.5 nm) protected with oleylamine were first synthesized via organic solvothermal method and further used as a filler. For this purpose, a simple colloidal method for preparation of Ag NPs in organic solvent was developed. PS was selected as the polymer matrix based on its optical transparency and high chemical resistance. The gel permeation chromatography (GPC) measurements showed that the presence of Ag NPs stabilized with oleylamine during the polymerization of styrene have no influence on the molecular weight and polydispersity of the PS matrix. The structural properties of the resulting Ag/PS NCs were characterized by transmission electron microscope and FTIR spectroscopy. The influence of the presence of Ag NPs and their concentration on the optical properties of PS matrix was investigated in details using UV-Vis spectroscopy. Since the PS represents a nonabsorbing medium throughout the visible spectrum, the improvement of the optical performances of polymer was achieved by incorporation of the appropriate size Ag NPs with strong plasma resonance absorption.