

**- Abstract -**

**„Synthesis of Block Copolymers containing conductive segments  
based on Controlled Polymerization Techniques “**

Headlined with „*Synthesis of Block Copolymers containing conductive segments based on Controlled Polymerization Techniques*“, the preparation of poly(*N*-vinylcarbazole)-*b*-poly(styrene) (PNVCz-*b*-PS), poly(*p*-phenylene)-*b*-poly(styrene) (PPP-*b*-PS), and poly(3-hexylthiophene)-*b*-poly(styrene) (P3HT-*b*-PS) using new combinations of nitroxide-mediated radical polymerization (NMRP) with the techniques „free radical polymerization“ (FRP), „SUZUKI-polycondensation“ (SPC) and „GRIGNARD-metathesis“ (GRIM) were done within this work. The successful synthesis of block copolymers after preparation of macroinitiators and following polymerization with styrene under NMRP-conditions was proved by size-exclusion chromatography (SEC) using a combination of RI- and UV-detection.

A new alkoxyamine, modified with a thioacetic-group, was isolated. It was used as a transfer agent in FRP and allow the introduction of an *N*-oxyl as polymer end-group, and further chain growth using NMRP. The microwave-synthesis of PPP-macroinitiators was investigated. MALDI-ToF-mass spectrometry was used for end-group determination. The preparation of P3HT-*b*-PS was accomplished with azid/alkyne „Click“-chemistry. Further polymer characterization was done using UV-vis-spectroscopy and DSC-measurements. Finally phase separation of thin films in nm-scale was investigated with AFM-measurements.