

BOOK OF ABTRACTS

19TH NATIONAL SYMPOSIUM POLYMERS 2019 OPEN TO INTERNATIONAL PARTICIPATION

September 9 - 12, 2019

Pomorie, Bulgaria

FOREWORD

Dear colleagues and friends,

We are delighted to welcome you at the 19-th National Symposium POLYMERS 2019 which is organized jointly by the Institute of Polymers – Bulgarian Academy of Sciences, the University “Prof. D-r Asen Zlatarov” – Burgas and the University of Chemical Technology and Metallurgy – Sofia from 9-th to 12-th September, 2019 at the Art Gallery “Dechko Stoev” in Pomorie, Bulgaria, under the patronage of Mr. Ivan Alexiev – Mayor of Pomorie Municipality.

Since 1967 Symposium Polymers has become the most important forum in Bulgaria for presenting and discussing research results in all sub-areas of polymer science. Traditionally, it brings together researchers from Bulgaria and from all over the World to communicate and disseminate the latest knowledge and developments in polymer chemistry, materials and technologies.

The symposium program includes 5 sessions covering topics from polymer synthesis and characterization, polymer engineering, processing and recycling, nanoparticles and nanocomposites, biopolymers and bio-related materials to innovative technologies and applications. Within the symposium, 5 plenary lectures, 5 keynote lectures, 14 oral and 47 poster presentations will be delivered by participants from 8 countries from Bulgaria, Poland, Turkey, Greece, Slovak Republic, Romania, USA and Japan.

We thank all participants for their valuable contribution and for sharing their latest results and innovative ideas in the field of Polymer Science.

Neli Koseva and Petar Petrov

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P11

Light – mediated thiol-ene coupling reaction induced by LED UV source

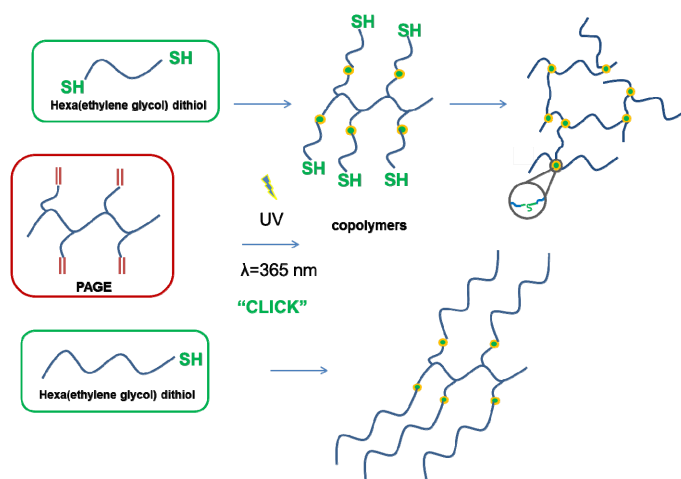
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The possibilities of novel methodology for thiol-ene modification of (co)polymers accomplished under LED UV-irradiation without any photoinitiator were explored. For this purpose allyl functionalized poly(allyl glycidyl ether) (PAGE) homopolymer ($M_n=1000 \text{ g}\cdot\text{mol}^{-1}$, $DP=9$) prepared via anionic ring-opening polymerization were reacted with mono- and di functional polyethylene glycols (PEG) thiols. The setup includes LEDs as light sources, emitting at fixed 365 nm appropriate for various polymeric and biological materials wavelength. This provides opportunities to conduct effective photoinitiated experiments by illumination of the reaction mixture directly inside the connected to the nuclear magnetic resonance (NMR) spectrometer testing tube. Thus the progress of the reaction was easily followed by whole variety of NMR methods: from conventional ^1H NMR or ^{13}C to diffusion NMR spectroscopy (DOSY) allowing entirely study of photochemical reactions as well as the process of association/aggregation of macromolecules in solution.

Molecular mass characteristics of the purified thiol-ene functionalized final products, was provided by gel-permeation chromatography (GPC). Together with the collected from NMR spectra data for the chemical composition the expected turnaround of “click” coupling reaction and formation of copolymers (Scheme 1) is supported. As seen, from our experiments the reaction efficiency strongly depends on the type of thiol (mono or dithiol) at the selected PAGE molecular weight. In some cases upon coupling with dithiol reagent, formation of a gel-fraction in a noticeable amount was observed, suggesting occurring of cross-linking reaction, which is subject of a further study.



Scheme 1

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