

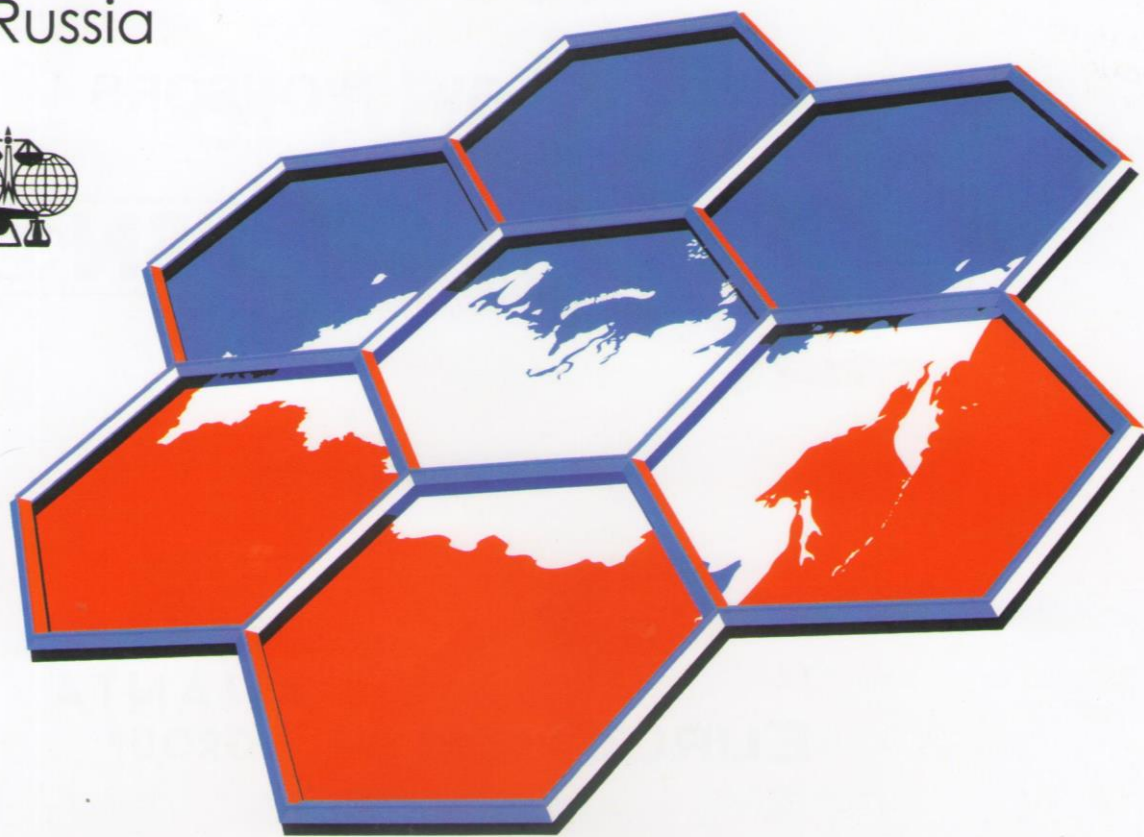
MAM 17



8th International IUPAC Symposium
«Macro- and Supramolecular
Architectures and Materials» (MAM-17)

Multifunctional Materials and Structures

6-10 June 2017
Sochi, Russia



Book of Abstracts

www.mam-17.org

<i>Khrebtov A.A., Fedorenko E.V., Lim L.A., Reutov V.A., Trifonov A.V.</i>	
RESEARCH OF THE INFLUENCE OF LUMINESCENCE OF BORON DIFLUORIDE DIBENZOYLMETHANATE ON THE SPECTRAL PROPERTIES OF BORON DIFLUORIDE ANTHRACENOYLACETONATE	49
<i>Neelova O.V., Gazzaeva R.A., Koblova L.B.</i>	
POLIORGANOSYLSESKVIOXAN COMPOSITION, INTENDED FOR USE IN NANO- AND MICROELECTRONICS	50
<i>Kononov A.I., Ramazanov R.R., Reveguk Z.V., Sych T.S., Vdovichev A.A.</i>	
DNA-BASED FLUORESCENT METAL CLUSTERS	51
<i>Kostina J.V.</i>	
THE EFFECT OF SOLVENT TO THE CONFORMATIONAL STRUCTURES OF COPOLYMERS ELEMENTARY UNITS: METHODS OF VIBRATIONAL SPECTROSCOPY IN THE INVESTIGATIONS COPOLYMERS OF STYRENE AND N-BUTYL ACRYLATE	52
<i>Kulikov L.A., Maximov A.L., Karakhanov E.A.</i>	
MESOPOROUS AROMATIC FRAMEWORKS: EFFICIENT SUPPORTS FOR HETEROGENEOUS CATALYSTS	53
<i>Kydralieva K.A., Dzhardimalieva G.I., Yaroslavov A.A., Jorobekova Sh.J.</i>	
FUNCTIONAL MATERIALS BASED ON HUMIC SUBSTANCES FOR ENVIRONMENTAL APPLICATION	54
<i>Lebedeva A.Yu., Tkachenko S.V., Chernikova E.Yu., Fedorova O.A.</i>	
COMPETITIVE INTERACTION BETWEEN BIS(STYRYL) DYES DERIVATIZED WITH CROWN-ETHER, DOUBLE-STRANDED DNA AND CUCURBIT[7]URIL	55
<i>Levchenko V.A., Buyanovskii I.A., Bol'shakov A.N., Matveenko V.N.</i>	
GREEN TRIBOLOGY OF FUNCTIONAL MATERIALS	56
<i>Maltsev V.V.</i>	
DETOXIFICATION OF UREA FORMALDEHYDE RESINS (UFR) AND UFR-BASED WOOD BOARD MATERIALS (WBM)	57
<i>Milaeva E.R., Shpakovsky D.B., Nazarov A.A., Tyurin V.Yu., Gracheva Yu.A., Antonenko T.A., Kharitonashvili E.V.</i>	
HYBRID METAL COMPLEXES WITH OPPOSED BIOLOGICAL MODES OF ACTION – CANDIDATES FOR BIOMEDICAL APPLICATION	58
<i>Mun G.A., Yermukhambetova B.B., Mangazbayeva R.A., Farrell S., Agibayeva L., Rapagatova K.</i>	
THE RADIATION CHEMICAL SYNTHESIS OF NEW THERMOSENSITIVE HYDROGELS BASED ON COPOLYMERS 2-HYDROXYETHYL METHACRYLATE AND THEIR PHYSICO-CHEMICAL BEHAVIOR	59
<i>Musatova V.Yu., Semenov S.A., Drobot D.V., Pronin A.S., Dzhardimalieva G.I.</i>	
SYNTHESIS AND INVESTIGATION OF MAGNETOACTIVE METALLOPOLYMER NANOMATERIALS BASED ON UNSATURATED COBALT (II), NICKEL (II) AND IRON (II,III) DICARBOXYLATES	60
<i>Naseer M.M.</i>	
HETEROATOM BRIDGED CALIXAROMATICS: SYNTHETIC STRATEGIES, CONFORMATION AND FUNCTIONALIZATION	61

THE RADIATION CHEMICAL SYNTHESIS OF NEW THERMOSENSITIVE HYDROGELS BASED ON COPOLYMERS 2-HYDROXYETHYL METHACRYLATE AND THEIR PHYSICO-CHEMICAL BEHAVIOR

OL27

Mun G.A.,¹ Yermukhambetova B.B.,¹ Mangazbayeva R.A.,¹ Farrell S.,² Agibayeva L.,¹
Rapagatova K.¹

¹al-Farabi Kazakh National University, Almaty, Kazakhstan

²Rowan University, Glassboro, New Jersey, USA

mungrig@yandex.kz

A new approach that was previously proposed [1] for the synthesis of thermally sensitive polymers was used. This approach is based on the radical copolymerization of monomers with a significant difference in hydrophilic-hydrophobic balance of the structure. In present work vinyl ether of ethylene glycol (VEEG) and 2-hydroxyethyl acrylate (HEA) were used as hydrophilic comonomers, and 2-hydroxyethyl methacrylate (HEMA) as a relatively hydrophobic comonomer. Water-soluble and water-swelling copolymers were obtained by radiation polymerization. The kinetics of copolymerisation process was studied. The copolymers were allocated on the initial stages of conversion and their compositions were determined by ¹H and ¹³C NMR spectroscopy; the copolymerization constants were calculated. The obtained copolymers show properties typical for thermosensitive polymers at a certain ratio of hydrophilic and hydrophobic units in macrochains, i.e. their aqueous solutions are characterized by a lower critical solution temperature. In this case the temperature of phase separation can be regulated within a wide range by varying the copolymer composition.

Hydrogels obtained by three-dimensional radiation copolymerization of HEMA and hydrophilic comonomers mentioned above in the presence of a crosslinking agent, also have a pronounced thermal sensitivity and show the ability to thermo-induced collapse or contraction. The possibility of adjusting the thermosensitive parameters within a wide range is provided by varying the nature and content of the hydrophobic component in polymer networks as well as complexing with the surfactants and polycarboxylic acids.

In this work firstly the thermosensitive polymers were obtained by radiation initiated grafting copolymerization of HEMA and gellan (Gel) in the presence of crosslinking agent N,N'-methylenebisacrylamide. The main patterns of forming the three-dimensional structure of HEMA-Gel hydrogel were studied. The increase of HEMA content in the initial monomer mixture leads to the decrease of gel fraction yield, as well as to the raise of swelling degree for obtained hydrogels. HEMA-Gel hydrogels possess manifest thermosensitivity. With the increase of temperature the synthesized hydrogel undergo to the contraction, which parameters can be regulated by changing the copolymer composition, as well as by interaction with the surfactants of anionic and cationic nature.

1. Nam I.K., Mun G.A., Urkimbaeva P.I., Nurkeeva Z.S. γ -Rays-induced synthesis of hydrogels of vinyl ethers with stimuli-sensitive behavior // Rad. Phys. Chem. 66 (2003), 281-287.