



Contribution ID: 53

Type: Talk

Molecular understanding of the structure and dynamics of supramolecular polymers

Tuesday, May 23, 2023 11:20 AM (20 minutes)

Supramolecular polymers, in which noncovalent interactions, like hydrogen bonds, keep the repeating units together, offer exciting prospects for materials with novel properties because the interactions are reversible. This is the case of diaminotriazine (DAT) and thymine-1-acetic acid (THY) (one of the nucleobases in DNA functional groups) that form heteromolecular interactions, and 2-ureido-4[1H]-pyrimidinone (UPY), building homomolecular association motives, respectively. The self-assembly of such supramolecular associations based polymers, in bulk and diluted state, have been investigated by means of neutron and X-ray scattering, rheology and dielectric relaxation spectroscopy.[1,2,3] The polymers consist of poly(alkylene oxide)s of differing polarity, i.e., of poly(propylene oxide) (PPO) and poly(ethylene oxide) (PEO).[3,4] In this talk, results on the correlation between polymer polarity, association strength of the functional end groups, and concentration on their structure and dynamics are highlighted.

A. R. B. acknowledges DFG for a research grant (BR5303) and “Quantum Matter and Materials”(QM2) of the UzK.

[1] A. Brás, A. Arizaga, D. Sokolova, U. Agirre, S. Prévost, A. Radulescu, M. T. Viciosa, M. Kruteva, W. Pyckhout-Hintzen, A. M. Schmidt, *Macromolecules*, 2022, 55, 22, 10014

[2] A. Brás, A. Arizaga, U. Agirre, M. Dorau, J. Houston, A. Radulescu, M. Kruteva, W. Pyckhout-Hintzen, A. M. Schmidt, *Polymers*, 2021,13, 2235.

[3] M. Kruteva, A. R. Brás, W. Antonius, C. H. Hövelmann, A. S. Poulos, J. Allgaier, A. Radulescu, P. Lindner, W. Pyckhout-Hintzen, A. Wischnewski, D. Richter, *Macromolecules*, 2015, 48, 24, 8933.

[4] A. R. Brás, C. H. Hövelmann, W. Antonius, J. Teixeira, A. Radulescu, J. Allgaier, W. Pyckhout-Hintzen, A. Wischnewski, D. Richter, *Macromolecules*, 2013, 46, 9446.

[5] M. Monkenbusch, M. Kruteva, W. Pyckhout-Hintzen, W. Antonius, C. H. Hövelmann, J. Allgaier, A. Brás, B. Farago, A. Wischnewski, D. Richter, *Physical Review Letters*, 2016,117 (14) 147802.

Primary authors: ARIZAGA, A. (Institute of Physical Chemistry, University of Cologne, Cologne, Germany); BRÁS WÜRSCHIG, Ana (University of Cologne); RADULESCU, Aurel (Forschungszentrum Jülich GmbH, Jülich Centre for Neutron Science at MLZ); SOKOLOVA, D. (Institute of Physical Chemistry, University of Cologne, Cologne, Germany); HOFFMANN, Ingo (Institut Laue-Langevin); DORAU, M. (Institute of Physical Chemistry, University of Cologne, Cologne, Germany); KRUTEVA, Margarita; Dr VICIOSA, Maria Teresa (Institute of Nanoscience and Nanotechnology, Instituto Superior Técnico, University of Lisbon, Avenida Rovisco Pais, Lisbon, Portugal); MONKENBUSCH, Michael (FZF, JCNS-1); Dr BACH, P. (Institute of Physical Chemistry, University of Cologne, Cologne, Germany); PRÉVOST, Sylvain (Institut Laue-Langevin (ILL)); AGIRRE, U. (Institute of Physical Chemistry, University of Cologne, Cologne, Germany); PYCKHOUT-HINTZEN, wim (forschungszentrum juelich)

Presenter: BRÁS WÜRSCHIG, Ana (University of Cologne)

Session Classification: Hybrid biomaterials

Track Classification: Hybrid biomaterials