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FOREWORD

Macromolecular chemistry in Austria

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Polymers are everywhere in today's life and find applications in packaging, storage, buildings, agriculture, transportation, mobility, electronics, medicine, energy technologies, and many more. Despite its sometimes-negative images caused by the huge amount of plastic waste in the nature all around the world, a modern life without this versatile class of material is not imaginable. Thus, polymer science is on the verge of a significant change toward a sustainable and circular economy of polymeric materials. We, as macromolecular chemists, have the challenge to reduce the negative impact of plastics by looking for new "greener" polymers, innovative synthesis protocols, by increasing the lifetime in long-lasting applications, introduce biodegradable polymers in applications in which pollution by them cannot fully be excluded, and last but not least find (chemical) recycling schemes for all materials.

Austria has a strong tradition in macromolecular chemistry and polymer science, both in academic as well as industrial background. The work group Macromolecular Chemistry of the Austrian Chemical Society (GOECH) has more than 160 members active in many different areas of macromolecular chemistry.

The current issue of Monatshefte für Chemie—Chemical Monthly contains a series of articles representative for the Polymer Chemistry conducted in Austria. Works from research groups located in Graz, Leoben, Linz, and Vienna, the most important locations where Polymer Chemistry is conducted in Austria, are collected. A larger overview can be gained in the abstracts books of the Polymer Meeting series, e.g., in the latest issue from the conference held in Graz in 2021 [1].

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Without doubt, polymer photochemistry is one of the most prominent research fields and four works of this issue deal with this topic. Stefan Baudis (Technische Universität Wien) and co-workers describe the preparation of poly(2-oxazoline)s featuring coumarins as pendant groups and the light-induced crosslinking of these polymers to form hydrogels [2]. Sandra Schlögl (Polymer Competence Center Leoben GmbH) and colleagues present a formulation for vat photo-polymerization offering a sequence-dependent orthogonality of the curing and a cleavage reaction [3]. A collaborative work of researchers from Graz, Vienna, China, and Iran presents the synthesis of dye-labeled aromatic azides for multi-photon grafting [4]. Ian Teasdale (Johannes Kepler University Linz) and co-workers describe the thiol-ene copolymerization of polyphosphazenes substituted with a vinyl carbonate functionalized amino acid with vinyl esters and demonstrate considerably accelerated degradation rates under mild conditions [5]. The research team headed by Klaus Bretterbauer (Johannes Kepler University Linz) presents optimized synthesis routes for dodecyl and octadecyl acrylamide and their respective homopolymers and studies the nanophase separation of these polymers [6]. A further publication of the same group is dealing with the synthesis of catechol bearing poly(acrylamide)s aimed at underwater bonding [7]. Two works focus on porous polymers another focal point of Polymer Chemistry in Austria. A collaborative paper (National Institute of Chemistry Ljubljana, VARTA Innovation GmbH, and Graz University of Technology) presents the preparation of macro-porous carbon coatings through carbonization of emulsion-templated poly(dicyclopentadiene) on metal substrates and the use of these structures as binder-free current collector in lithium-sulfur cells [8]. The other contribution in the field of porous polymers is from Andreas Mautner (University of Vienna) and collaborators and presents the foaming of oxidized nano-cellulose for the preparation of high-flux water filters [9]. Anna Maria Coclite (Graz University of Technology) and co-workers demonstrate in a proof-of-concept study that vinyl-modified carbohydrate compounds are suitable monomers for thin-film polymerization via chemical vapor deposition [10]. Thin polymer films are also of utmost importance in organic electronics. Gregor Trimmel (Graz University of Technology) and group members describe the synthesis of a fluorine- and quinoxaline-based co-polymer and use the material as active layer in organic light-emitting devices [11]. Finally, a review article on poly(ether)-synthesis via oxa-Michael polymerization [12] contributed by researchers from the Christian Doppler Laboratory for Organocatalysis in Polymerization (Graz University of Technology) is disclosed.

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Enjoy the science presented in this issue,
Christian Slugovc and Gregor Trimmel.

Data availability Not applicable.

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