

GUEST EDITORIAL

Advanced Polymer Design and Synthesis

Polymers are the most versatile and diverse materials ever to be created either by humans or by Nature, and the properties and utility afforded by these magnificent materials enable most of the new inventions of our times. New paradigms abound, and polymer researchers no longer need to confine themselves to conventional materials that are merely plastics or elastomers. Nature also continues to teach much and inspires emulation. Polymers are the key elements that support life and encode genetic information, manufacture molecules, define shapes, and enable movement.

The synthetic polymer world, although not capable of reproducing the precise sequence control and uniformity of Nature, nevertheless has much to be proud of. Polymeric materials can exhibit the tensile strength of steel, the electrical conductivity of copper, the photovoltaic and transistor properties of semiconductors, and the actuating properties of human muscle. Critical to the realization of these properties is the imaginative molecular design and syntheses that are exemplified by researchers highlighted in this special issue of *Accounts of Chemical Research*, and we hope that you share our excitement and opportunities that continue to feed the creative desires of the synthetic polymer community. We are in an era with a rapidly expanding "molecular toolbox", and we are presented with a torrent of new chemistries enabling new monomers, polymers with complex connectivities, nanostructures, and precise control of molecular weight.

In this exciting time, it is not possible for *Accounts of Chemical Research* to provide comprehensive coverage of the field of polymer design and synthesis in one special issue. While each of the contributors has made important contributions to the field of polymer chemistry, there are many other excellent programs around the world that are not represented. It is our hope that these Accounts will inspire current and future generations of chemists to create ever more useful and diverse materials. Important societal needs, such as sustainable energy, affordable health care, and personal protection, are all bounded by current limitations in materials properties. Polymers will continue to be the enabling materials that make the world a better place.

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