



William Dichtel

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William Dichtel received a B.S. in Chemistry from MIT and Ph.D. from UC-Berkeley under Prof. Jean M. J. Fréchet. He was a postdoctoral researcher with Prof. Fraser Stoddart at UCLA, and Prof. James Heath at Caltech. He began his independent career at Cornell University in 2008 and was promoted to Associate Professor in 2014. In 2016, he moved to Northwestern University as the Robert L. Letsinger Professor of Chemistry. His research has expanded the study of polymerization into the second and third dimensions in polymers known as covalent organic frameworks, porous polymers for water purification, and new approaches to polymer recycling. Dichtel has been recognized with a MacArthur Fellowship, the Leo Hendrik Baekeland Award of the North Jersey Section of the ACS, and as the 2020 Blavatnik National Laureate in Chemistry.

Abstract: “Two Dimensional Polymers and Polymerizations”

Synthetic chemists have developed robust methods to synthesize discrete molecules, linear and branched polymers, and disordered cross-linked networks. However, two-dimensional (2D) polymers prepared from designed monomers have been long missing from these capabilities, both as objects of chemical synthesis and in nature. Recently, new polymerization strategies and characterization methods have enabled the unambiguous realization of 2D, covalently linked macromolecular sheets. We have developed tools to study these polymerizations experimentally and computationally, which has given rise to the first controlled two-dimensional polymerizations, along with materials of improved quality. Furthermore, a new solid-state polymerization approach provides access to two-dimensional polymers containing mechanical bonds at each repeat unit. These approaches and the properties of high-quality 2D polymers that are now emerging will be presented.