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Valorization of Plastic Waste: Research Advances in Molecular Recycling

Polymers are highly versatile materials that constitute numerous products, ranging from the ubiquitous water bottles to personal protection equipment. 44 million tons of plastic waste were managed in the US in 2019, with 86 % of all that plastic landfilled, and only 5 % recycled. We can and must do better than this, for the benefit of future generations. The presentation will first report on trends on plastic production, use and misuse, discuss recent disruptions affecting plastic waste management, and point to current concerns of plastics contributing to greenhouse gas emissions and littering the oceans and the land. The spotlight will then shine on various initiatives by foundations and governments aimed to the reduction in the amount of plastic that ends up in landfills and the increase in the amount of post-consumer plastic in various products. Last, recent research advances will be highlighted in the identification of plastic type for mechanical recycling, and in solvent-based molecular recycling of plastic waste.