Special Issue

Chemical Catalysis for Waste Plastics Recycling and Upcycling

Message from the Guest Editor

Plastics seem to be everywhere: soil, water or biological organisms. Given their non-biodegradability, plastics are expected to persist in landfills for centuries to millennia. In addition, plastic leakage into the natural environment is a global pollution crisis, with an estimated 4.8 million to 12.7 million tons of plastic entering the Marine environment each year. Given this looming environmental disaster, we urgently need to develop a plastic circular economy, which will not only provide a means to reduce plastic pollution, but also reduce the greenhouse gas emissions associated with plastic manufacturing and raw material production. To address this challenge, opportunities exist for chemical recycling (tertiary recycling), which breaks down plastics into monomers that can be used to synthesize the same plastic with the properties of the original material (closed-loop recycling) or to convert it into another material (open-loop upcycling if the end product is of higher value). Catalysis is central to numerous industrial processes and will be crucial to the success of chemical recycling of waste plastics.

Guest Editor

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Deadline for manuscript submissions

closed (30 June 2023)

Catalysts

an Open Access Journal by MDPI

Impact Factor 4.0
CiteScore 7.6

mdpi.com/si/151299

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