

## **Challenges in plastic circularity: The necessity for environmental degradability as a design metric**

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The high visibility of marine plastic pollution, coupled with growth in broad concerns for the environment, has made modern society question its long-accepted materials management practices. The status quo of our materials management systems constructs a linear economy (i.e., make-take-dispose), whereas a circular economy (i.e., one that relies on substantial material recovery rather than disposal) is favored to reduce the burden of waste. However, there are major challenges to implementing materials circularity. Even with circular management systems in place, there will always be some fractional loss to the environment. Since plastics production continues to rise exponentially and *the next 15 years of plastic production will outweigh all previous fabrication*, strategies are needed to ensure these fractional losses are ultimately degradable. This talk will first review the current materials management strategies and challenges to a circular economy, highlight why our goods should be implicitly degradable, discuss what it means to be “biodegradable” versus environmentally labile, and finally lay out research to accelerate discovery to inform a new future of implicitly degradable and/or reusable plastics.