

Is Recycling Sustainable?

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ABSTRACT

We are now in the era of Anthropocene. "Our planet is choking on plastics." 6 out of 9 indicators crossed the planet boundaries. Anthropogenic CO₂ emissions surpass the natural CO₂ absorption of 310 billion C ton/year, and the accumulated atmospheric CO₂ concentration reached 420 ppm in 2023 since the industrial revolution 280 ppm. The Earth is now in the state of the high-risk line for human survival.

The concept of the circular economy emerged where we should eliminate waste and pollution, circulate products and materials, and regenerate nature. An immediate action for the circular economy in textiles is to extend the life of textile products through reuse and repair and keep end-of-life (EoL) materials in the economy through recycling. Here, recycling plays a vital role in the textile circular economy, but the recycling process itself is also required to be sustainable.

We examine the environmental impact of various recycling processes, and propose a new recycling process of less environmental impact and its application for post-industrial wastes.