

# **Closing the material loop of Polyethylene terephthalate through chemical recycling technologies**

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A major challenge for the implementation of a circular economy is the low recyclate quality of post-consumer plastic waste after thermomechanical treatment. Especially during the processing of Polyethylene terephthalate (PET) post-consumer waste from food packaging or textiles a quality decrease of the polymer is observed or recycling is impossible. To overcome this challenge in the past years several back-to-monomer recycling technologies have been developed for the treatment of post-consumer PET-materials to recover the building blocks of the polymer in pure form.

The different approaches (Glycolysis, Methanolysis, Hydrolysis, Aminolysis) for the chemical recycling of PET will be presented and main challenges of the technologies will be evaluated. It will be focused on the use of a twin-screw extruder as a continuous reactor for the depolymerization of PET in the different processing approaches. Furthermore, the processability in state of the art PET production lines of the different products after the depolymerization will be evaluated.