

# Editorial

## Plastic: Recycled back to Crude Oil

Plastic has a big strength. However this strength at the same time has been a great weakness while it scarcely disintegrates and therefore enriched in nature always in bigger quantities. An exit from this dilemma is the recycling of plastic which in the production go to as wastes or also can be today in the industry as transport packing mostly good retrieved into money, while the pickings as a rule are scarcely dirty and to that are for sorting clean.

But the challenge remains before all packing rubbish which falls to which with the final users, empty yoghurt cups, layered liquor beverage cardboard foils in which fresh meat was steamed. Most of that land in yellow sacks — as multi-coloured mix out of different plastic types which can hardly be separated from one another and with that also not again be melted to pure plastic. Additionally a middle valued mixture which then often only heated and formed in to park benches or to beer boxes.

The chemical recycling could be an alternative: Frederik R. Wurm of Max. Plank Institute for polymer research in Mainz researches on that. His ideas consist in that plastic predetermined to produce such that these receive molecular breaking point at which these during the recycling are chemically decomposed disintegrated in order that these finally unite together to new materials. “That however presumes that one conceives plastic in future from molecule and therefore already with the manufacture makes the thought on the recycling” says Mr. Wurm. The packing industry however is interested hither to sooner for the activities.

Mr. Wurm and his coworkers of Max Planck Institute modify among other polyethylene (PE) appropriate. Polyethylene (PE) is worldwide the most frequently used plastic which before all is prepared for packing and with that specially

contribute strongly for garbage eliminating of nature. Polyethylene (PE) scarcely decompose in nature. The Max Planck researcher has therefore introduced molecular clefts in PE, as for example so called orthoester and phosphate.

“The installation cares for that: PE supports little by little in molecular fragments which fall to pieces the small pieces are sufficient in order to be prepared from bacteria” Mr. Wurm clarifies. The skill consists in that it first at the end of product falls to pieces and not already then when the Joghurt cup remains in the refrigerator.

Another way would be the plastic to decompose in such a way that from that oil regenerates. However that basic product from which the plastic ingredients were obtained originally. The big advantage: The materials must neither be tidy (clean) nor sorting pure; because at the same time in its smallest components is split. In south of Austria as for example oil and gas concern OMV and the chemical undertaking Borealis have developed the Re oil process, where plastic wastes are recycled back to crude oil.

They could take an important hurdle which largely complicated the plastic to oil transformation. Plastics is bad conductors of heat and must be exposed to longer duration to high temperature in order to dissolve their components. First above 400°C the long plastic molecular chains are depolymerised and it generates plastic crude oil. Both the concerns however have found out a fluid solution medium which improves the heat transmission on plastic so that the pilot plant comes out with less energy. It can process upto 100 kg plastic per hour at the end out of that process about 100 litre valuable crude oil is obtained.

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