



Converting plastic waste to useful materials

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A new process converts mixed plastic waste into a useful chemical feedstock. The process could improve recycling by eliminating the need to sort and separate different waste materials.

The process works on a mixture of three common plastics: poly(styrene), high-density poly(ethylene) and poly(ethylene terephthalate) (PET). The first step of the process uses a catalytic oxidation reaction to convert the polymer waste into a mixture of carboxylic acids. In a second step, the carboxylic acids react with a genetically engineered bacteria to produce chemicals that can make polyesters and nylon.



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Genetically engineered bacteria produce the useful chemical feedstock

Questions

1. Why could the process be called 'dual chemical-biological'?
2. Explain how the process could solve a problem with recycling plastics.
3. Draw the functional group in:
 - a) a carboxylic acid
 - b) a polyester