

Plastic products leach toxic substances

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Many plastic products contain hazardous chemicals that can leach to the surroundings. In studies conducted at the University of Gothenburg, a third of the tested plastic products released toxic substances, including 5 out of 13 products intended for children.

"Considering how common plastic products are, how quickly the production of plastic has increased and the amount of chemicals that humans and the environment are exposed to, it is important to replace the most [hazardous substances](#) in plastic products with less hazardous alternatives," says Delilah Lithner of the Department of Plant and Environmental Sciences at the University of Gothenburg.

[Plastics](#) exist in many different chemical compositions and are widespread in the society and the environment. Global annual production of plastics has doubled over the past 15 years, to 245 million tonnes in 2008. The plastic polymers are not regarded as toxic, but there may be toxic residual chemicals, chemical additives and degradation products in the plastic products that can leach out as they are not bound to the [plastic polymer](#). Plastics also cause many waste problems.

In her research, Lithner studied the toxicity of 83 randomly selected plastic products and synthetic textiles. The newly purchased products were leached in pure (deionised) water for 14 days. The acute toxicity of the water was then tested using water fleas (*Daphnia magna*).

"A third of all the 83 plastic products and synthetic chemicals that were tested released substances that were acutely toxic to the water fleas,

despite the leaching being mild. Five out of 13 products that were intended for children were toxic, for example bath toys and buoyancy aids such as inflatable armbands," says Delilah Lithner.

The products that resulted in toxic water were soft to semi-soft products made from plasticised PVC or polyurethane, as well as epoxy products and textiles made from various plastic fibres. The [toxicity](#) was mainly caused by fat-soluble organic substances.

Lithner also studied the chemicals used to make around 50 different plastic polymers and has identified the plastic polymers for which the most hazardous chemicals are used. They were then ranked on the basis of the environmental and health hazard classifications that exist for the chemicals. Examples of plastic polymers made from the most [hazardous chemicals](#) are certain polyurethanes, polyacrylonitriles, PVC, epoxy and certain styrene copolymers. The results are of great benefit for further assessing environmental and health risks associated with plastic materials.

Provided by University of Gothenburg

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