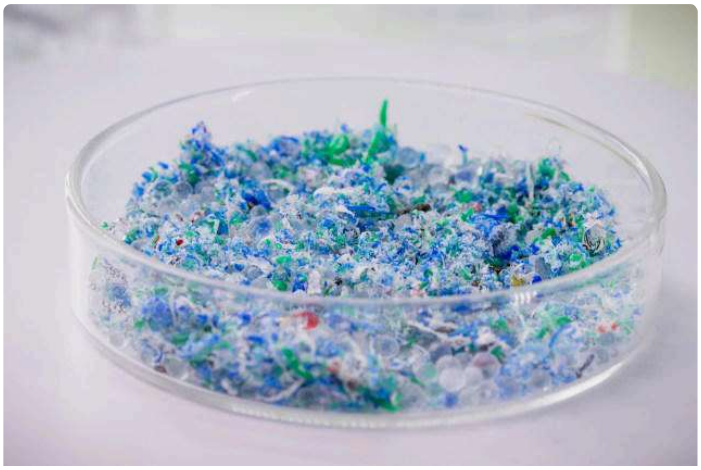
Scientists make critical breakthrough with method that can turn microplastics into material stronger than steel — here's how it can be used

Story by Katherine Hammer • 9h • 3 min read



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Researchers have discovered an innovative process to transform harmful microplastics into graphene, a highly durable substance with widespread capabilities, reported Interesting Engineering. It's a scientific breakthrough and an optimistic development in tackling the global plastic crisis.

into harmless molecules," National Geographic summarized.

Microplastics linger in the environment and show up in our food, water, land — and, subsequently, our bodies. They have been linked to significant health concerns, including ADHD, autism, heart attacks, and infertility.

They aren't rare, either: A 2019 study concluded that, on average, people unintentionally consume a weekly 5 grams (or the weight of a credit card) in plastic.

Besides minimizing the use of plastic products, is there any way to reduce our ingestion of these toxic substances? It's the question that Professor Mohan Jacob and Dr. Adeel Zafar from Australia's James Cook University (JCU) sought to answer in their recent research, as detailed by Interesting Engineering.

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"These microplastics are notorious for their non-degradable and insoluble nature and are an evolving threat to fish and animals and humans," Jacob said in a university release. But recycling microplastics is complex, highly involved, and expensive — for many, prohibitively so, explained Dr. Zafar.

So, the scientists explored an alternative: Upcycling, "which involves transforming plastic waste into higher-value materials rather than simply breaking it down," Dr. Zafar said in the JCU release.

That "higher-value" product the team worked to reconstruct from the useless plastic particles? Graphene — a material that "is harder than diamond, 200 times stronger than steel, and five times lighter than aluminum," per Interesting Engineering.

The results of the study proved encouraging. With the new Atmospheric Pressure Microwave Plasma (APMP) synthesis technique, the researchers illuminated how microplastic waste "can be efficiently transformed into graphene," Interesting Engineering explained.

The APMP process has a "remarkably higher" rate of production and is a "simpler, more environmentally friendly alternative to current techniques," Dr. Zafar stated.

Graphene, as Dr. Zafar noted per JCU, "has a high demand" in many industries, including energy storage, biomedicine, and water purification (where it can help detect and absorb per- and polyfluoroalkyl substances: the toxic forever chemicals that contaminate our natural resources and wreak havoc on our health).

Ultramodern methods such as these mean that microplastics could someday go from harmful to maybe even helpful.

This graphene processing is just one of many thoughtful, creative, and inventive steps that entrepreneurs, scientists, and everyday citizens are taking to address the plastic pollution problem — so that we all can enjoy a cleaner, safer world for generations to come.

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