

Now, you can recycle thermocol using orange peel

Researchers from IIT Hyderabad have built a prototype

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It takes hundreds of years for polystyrene (thermocol being a widely used form of it) to be degraded in the natural environment. But in a solution of orange peel extract, it dissolves almost instantly - without the aid of external heat, pressure or acid.

Now a group of researchers from the Indian Institute of Technology (IIT), Hyderabad, has demonstrated a cheaper, low-energy, and green way of recycling polystyrene and low density Styrofoam (a form of expanded polystyrene) using orange peel extract. They have a working prototype, and a pilot-scale machine to recycle polystyrene is under construction.

The necessary fruit extract can be obtained simply by squeezing the orange peels.

Third is dumped

Currently, only about 12% of polystyrene waste gets recycled, and nearly a third is dumped in landfills. Worldwide, about 31 million tonnes of citrus fruits are produced annually, and 50% of it is waste in the form of citrus peel. The fruit juice industry in particular generates large quantities of citrus peel waste.

Limonene, which is one



Going green: Researchers have demonstrated a low-energy, and green way of recycling polystyrene. ■ SPECIAL ARRANGEMENT

of the components of the extract, is capable of dissolving polystyrene but is currently not used for this purpose.

"Compared with limonene, the whole extract can dissolve polystyrene five times more," says Professor Chandra Shekhar Sharma from the Department of Chemical Engineering at IIT Hyderabad, who has incubated a start-up at the IIT Hyderabad Technology Incubation Centre, and also filed a patent application.

The project has received financial support of ₹37 lakhs from the Technology Development Board, Department of Science and Technology (DST) under the Waste Management Programme. The innovation also won a gold medal in the recently concluded World Invention and Innovation Forum (WIIF) 2017 in

Guangdong, China.

The process basically involves dissolving polystyrene in the citrus extract and drawing it into fibres using wet/solution spinning. The fibre is then turned into a non-woven fabric of 1 sq. foot size. Since fabric made of recycled polystyrene is naturally oil-loving, it can be used for day-to-day household cleaning in kitchens, and also for large-scale removal of oil-spills.

More life cycle

"Using the orange peel extract to dissolve polystyrene will not change the chemical composition, and so will not make polystyrene into a biodegradable product. What this process does is to extend the use and life cycle of polystyrene waste material," says Prof. Sharma.