

New technique allows plastic to cast off heat

Chicago: Researchers in materials science and mechanical engineering at the University of Michigan (UM) have developed a new technique that can change plastic's molecular structure to help it cast off heat.

The new technique uses a process that engineers the structure of the material itself, considering the nature of plastics made of long chains of molecules that are tightly coiled and tangled like a bowl of spaghetti, Xinhua reported.

It used a chemical process to expand and straighten the molecule chains, giving heat energy a more direct route through the material.

To accomplish this, the researchers first dissolved a typical polymer, or plastic in water, then added electrolytes to the solution to raise its pH, making it alkaline.

The individual links in the polymer chain, called monomers, take on a negative charge, which causes them to repel each other. As the monomers spread apart, they unfurl the chain's tight coils.

Finally, water and polymer solution is sprayed onto plates using a common industrial process called spin casting, which reconstitutes it into a solid plastic film.

The uncoiled molecule chains within the plastic make it easier for heat to travel through it.

Researchers also found that the process has a secondary benefit: it stiffens the polymer chains and helps them pack together more tightly. The work has important consequences because of the large number of polymer applications where temperature is important. —Agencies