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САМОВІДНОВЛЮЮЧІ ПОЛІМЕРИ "ЗАГОЮЮТЬСЯ" ПІД ВПЛИВОМ УЛЬТРАФІОЛЕТОВОГО СВІТЛА

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A SELF-HEALING POLYMER FILLS IN CRACKS

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The days of covering your dining room table in plastic for fear of a scratch and parking your new car at the farthest reaches of the grocery store parking lot might be numbered.

Researchers at Case Western Reserve University have developed a material that repairs itself when exposed to ultraviolet light. The polymer, they say, could one day be added to a range of products to create self-healing automotive paints and varnishes for furniture and floors.

What they have designed is essentially the ability for this polymer to disassemble on exposure to light. When it disassembles, the material reflows into the crack, and the system is healed. Stuart Rowan, PhD, a macromolecular scientist and engineer at the Case School of Engineering led the research team that developed the compound.

Unlike conventional polymers—which consist of long, chain-like molecules—the new compound is composed of smaller molecules, which are assembled into longer, polymer-like chains using metal ions as "molecular glue." Under intense UV light, the structures are temporarily unglued, transforming the originally solid material into a liquid that flows easily. When the light is switched off, the material reassembles and solidifies again, restoring its original properties.

The discovery was made in partnership between Rowan's team at Case Western Reserve and researchers from Switzerland's University of Fribourg and the Army Research Laboratory at Aberdeen Proving Ground in Maryland. The team's results were published in an April issue of *Nature*, and, though there is still a long way to go before self-healing paints and varnishes are available on the market, Rowan and his team say proving the concept works is an exciting first step.

New polymer heals itself—just add light. The days of living in fear of wayward shopping carts in parking lots might be numbered, thanks to a self-healing material discovered at the Case School of Engineering. A team led by Kent Hale Smith Professor Stuart J. Rowan, director of the school's Institute for Advanced Materials, has developed a polymer-based coating that repairs itself in seconds when exposed to UV light. Researchers say the material could be used in a range of products from automotive paints to varnishes for furniture and floors. The discovery still has a long way to go before self-healing paints and varnishes are available on the market, but researchers say proving the concept works is an exciting first step.