New polymer coatings prevent corrosion - UPI.com

CHAMPAIGN, Ill., Dec. 17 (UPI) -- U.S. scientists say they are developing new polymer coatings that will not only protect materials, but also help tiny scratches "heal" themselves.

University of Illinois researchers said applications for the coatings range from automotive paints and marine varnishes to the thick, rubbery coatings on patio furniture and park benches.

"Starting from our earlier work on self-healing materials ... we have now created self-healing coatings that automatically repair themselves and prevent corrosion of the underlying substrate," said Professor Paul Braun, corresponding author of the study.

The scientists said they first encapsulate a catalyst into spheres less than 100 microns in diameter -- a micron is 1 millionth of a meter. They also encapsulate a healing agent into similarly sized microcapsules. The microcapsules are then dispersed within the desired coating material and applied to the substrate.

"By encapsulating both the catalyst and the healing agent, we have created a dual capsule system that can be added to virtually any liquid coating material," said Braun. When the coating is scratched, some capsules break, spilling their contents into the damaged region. The catalyst and healing agent react, repairing the damage within minutes or hours, depending upon environmental conditions.

A paper detailing the research has been accepted for publication in the journal Advanced Materials.