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**Driving degradation within biodegradable polymers with embedded nanoparticles**[1] RUSSELL GORGA, GABRIEL FIRESTONE, DANIELA FONTECHA, JASON BOCHINSKI, LAURA CLARKE, NC State University —
The ability to controllably trigger breaking of chemical bonds enables a substance that has robust material properties during use but can be re-worked or deteriorated upon command. Photothermal heating creates intense local heat at isolated nanoparticle locations within a sample and can result in very different material responses than those achievable with conventional (uniform) heating. In this process, irradiation with visible light resonant with the nanoparticle's surface plasmon resonance results in dramatic local heating of the particles and the surrounding material. This work studies intentional thermal degradation of poly ethyl cyanoacrylate-starch composites doped with metal nanoparticles, and explores differences in degradation speed, efficiency, and resultant mechanical properties when heated via the photothermal effect.

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Russell Gorga
NC State University

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