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Title: Designing Materials Joining for Recovery

Abstract:

Consumer, industrial, and government products contain many different materials to decrease weight, increase efficacy, and present new functionalities. These include health monitoring devices, golf clubs, and other sporting equipment for consumer goods, eVTOLs, drones, and aircraft for aerospace, and electric, hybrid, or gas vehicles for automotive. Dissimilar material joints, or mixed-material composites, can be difficult to separate at the end of the products' lives. A profound understanding of the molecular structure at interfaces is required for joints to ensure the product will last its intended life and be detachable. During this presentation lightweight, strong, and reliable joint designs will be described for both joining and end-of-life separation. One example is polymer-to-metal direct joining where heat is used for the joint assembly and disassembly so that the polymer and metal can easily be sorted into different recovered streams for reuse. Other topics during the presentation will include material selection and joint design, which are equally as important for a successful product with materials that are poised for recovery.