Developing a Flexible, Stretchable, and Conductible Polyurethane/Liquid Metal Composite for Future Electronics

Xu, Kasey (School: St. John's School)

A flexible, stretchable, and conductible polyurethane/liquid metal composite was developed by combining polyurethane and gallium indium tin alloy liquid metal (Galinstan). The composite material was created by infusing galinstan into the polyurethane tube and sealing the ends to hardening. Thereafter, the resistance and the properties of tensile recovery were tested. As a result, the composite material could extend up to 299.5 % of its normal length without any significant electrical resistance changes until it reached beyond the maximum tensile point. After 100 stretching cycles, the resistance remains stable, thus showing the good reusability, stretchability, and stable conductivity of the composite material. These qualities support the composite material's usage in many applications in the real world, such as in medical technology and future electronics.

Awards Won: