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Conductive and Stretchable Silver-Polymer Blend as Interconnect for Flexible and Stretchable Electronics Applications

Stretchable and flexible electronics enable mobile health monitoring, a recently popular market trend. These devices can be integrated into medical sensors and displays. Wiring in the devices known as interconnects links vital components. Thus, to make the devices flexible, the interconnects must be flexible and stretchable as well. However, fabricating interconnects is one of the more complex and costly steps of chip manufacturing. The interconnects must be able to follow the mechanical movement of the device and maintain high conductivity at high levels of strain. Thus, there is a need to develop a simplified, cost-effective and scalable way to fabricate a high-performance, stretchable and conductive composite material.

Researchers at ASU have developed a polymer composite blend that offers a well-balanced combination of conductivity and elasticity. Silver flakes dispersed in a polymer blend comprise the structure of the flexible composite. The polymer blend offers a practical trade-off between conductivity and elasticity for the composite matrix. The polymer blend provides conductivity paths between the silver flakes, giving excellent electrical properties even at high deformations. By combining different polymers, the researchers were able to develop a composite material with advantageous electrical and mechanical properties from each of the polymers.

Potential Applications

- Wearable electronics
- Microfabrication
- Flexible displays

Benefits and Advantages

- Conductive and Stretchable – The interaction of the constituent chemicals makes the high ductility and conductivity of the composite possible
- Low Cost – The use of silver flakes allows manufacturing of the composite at lower cost in comparison to gold or graphene

For more information about the inventor(s) and their research, please see:

[Dr. Hongbin Yu's directory webpage](#)

