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Abstract

Strain sensors based on graphene are attracting a lot of attention for electronic applications due to its outstanding electrical and mechanical properties. In this paper, we propose a high stretchable strain sensor based on graphene flakes/ZnO composite, which is deposited on micro-random ridged type PDMS substrate. To connect between graphene flake to flake, ZnO nano particles are applied and best graphene flakes and ZnO nano particles blending ratio is 1:0.5. Using this ink, an active layer is fabricated on the micro-random ridged PDMS substrate at ambient conditions through commercialized inkjet printer DMP-3000. Especially, utilizing the micro-random ridged 1.06 mm thick PDMS substrate with surface roughness of 0.34, its stretchability is achieved up to 30%. The flexibility of the fabricated strain sensor is demonstrated down to 10 mm bending diameter. These results reveal that the proposed strain sensor has potential in diverse wearable electronic applications and diverse human motions.

Keywords: Graphene flakes, ZnO, micro-random ridged PDMS, stretchable sensor.

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