Mechanical stretchability of screen printed Agnanoparticles electrode on polyurethane substrate

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We report oncharacteristics of screen printed Ag nanoparticles (NPs) on a stretchablepolyurethane (PU) substrate for use as stretchable electrodes in wearableelectronics. In particular, mechanical properties of screen printed Ag NPselectrode were comprehensively investigated using specially designedinner/outer bending test, rolling tests, folding tests, and stretching tests.The Ag NPs electrode showed a critical inner bending and outer bending radiusof 3mm, rolling radius of 3mm and stretchability of 20% which are acceptableas a stretchable interconnects for wearable electronics. In spite of low sheetresistance 0.002 Ohm/square, the screen printed Ag NP electrode showed anoutstanding mechanical flexibility. In addition, we demonstrated promisingapplications of the screen printed Ag NP electrode in stretchable interconnectsand stretchable thin film heaters (TFHs) for wearable electronics.