

Supporting Information

Highly Flexible and Transparent Dielectric Elastomer Actuators using Silver Nanowire and Carbon Nanotube Hybrid Electrodes

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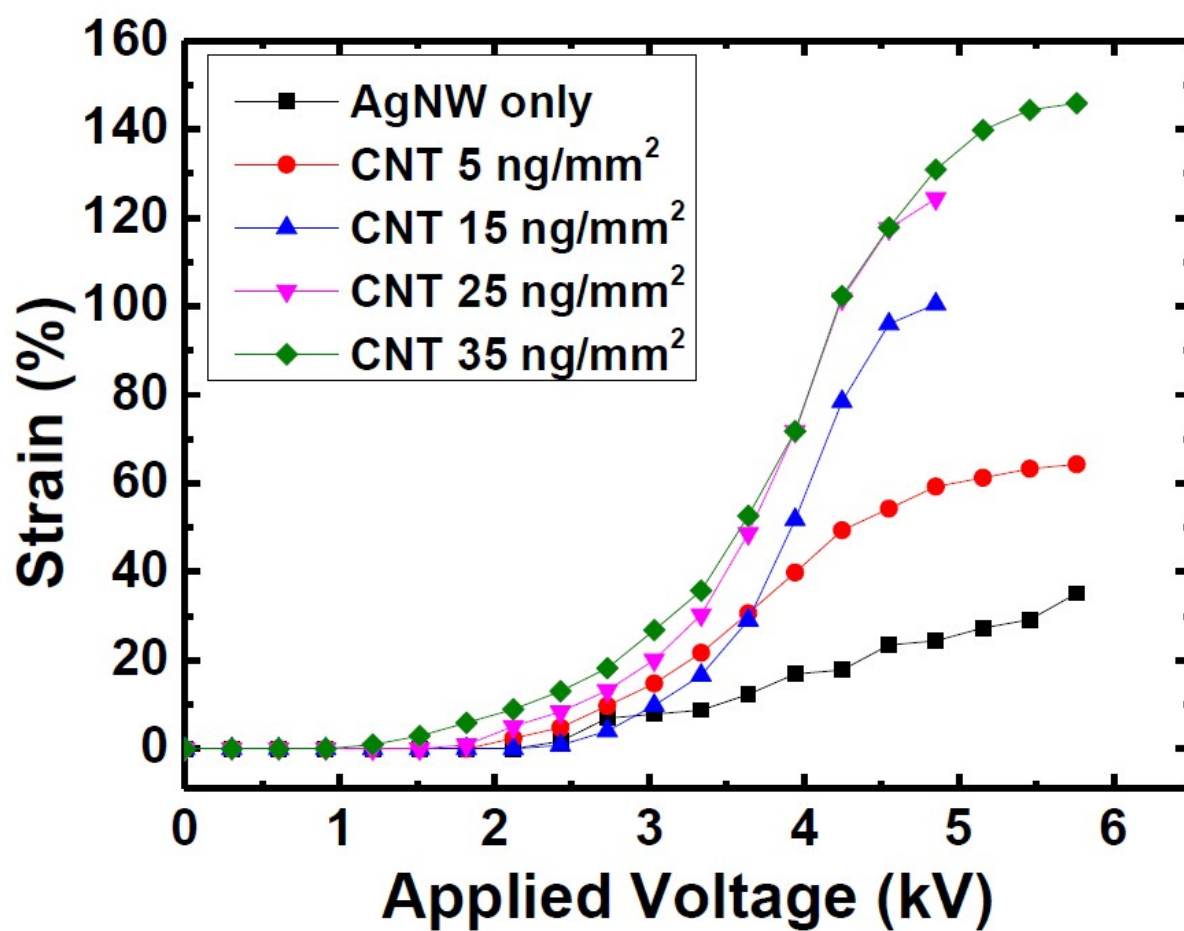


Figure S1. Actuation areal strain change as a function of applied voltage.

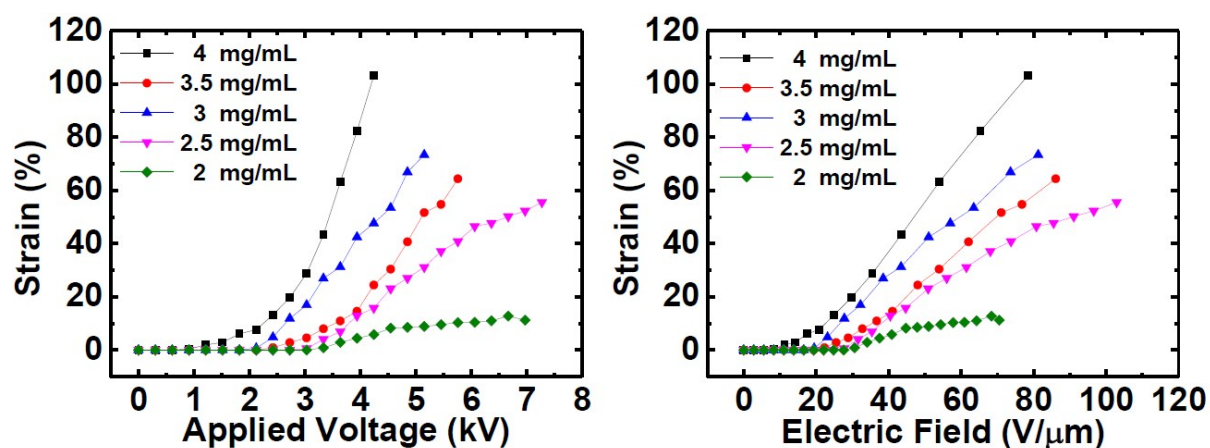


Figure S2. Actuation characteristics for DEAs with AgNW electrodes of different concentrations. (a) Actuation areal strain vs. applied voltage. (b) Actuation areal strain vs. electric field. The AgNW film shows a maximum strain of about 100 % and a maximum breakdown electrical field of 104 V/ μm .

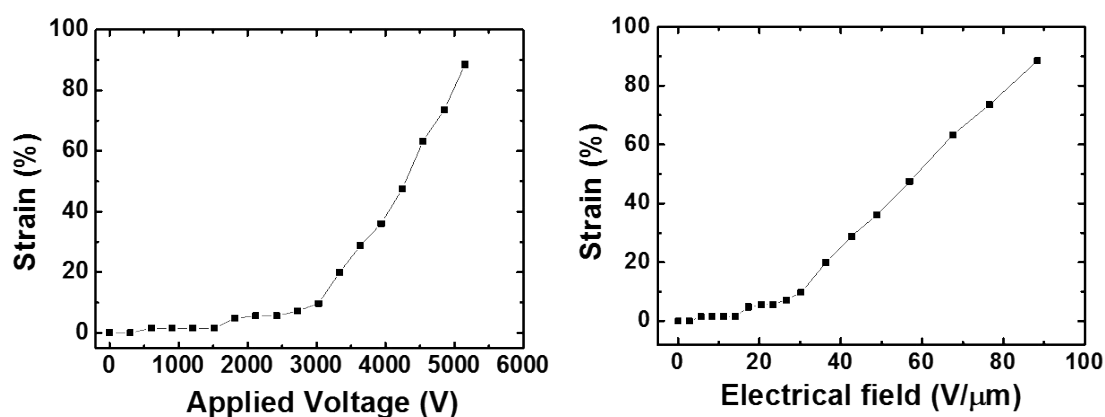


Figure S3. Actuation characteristics for DEAs with CNT-only electrodes. (a) Actuation areal strain vs. applied voltage for CNT electrodes with 35 ng/mm² areal density. (b) Actuation areal strain vs. electric field for CNT electrodes with 35 ng/mm² areal density. The SWCNT electrode (35 ng/mm²) shows a maximum strain of about 89 % and a maximum breakdown field of 88 V/ μm .

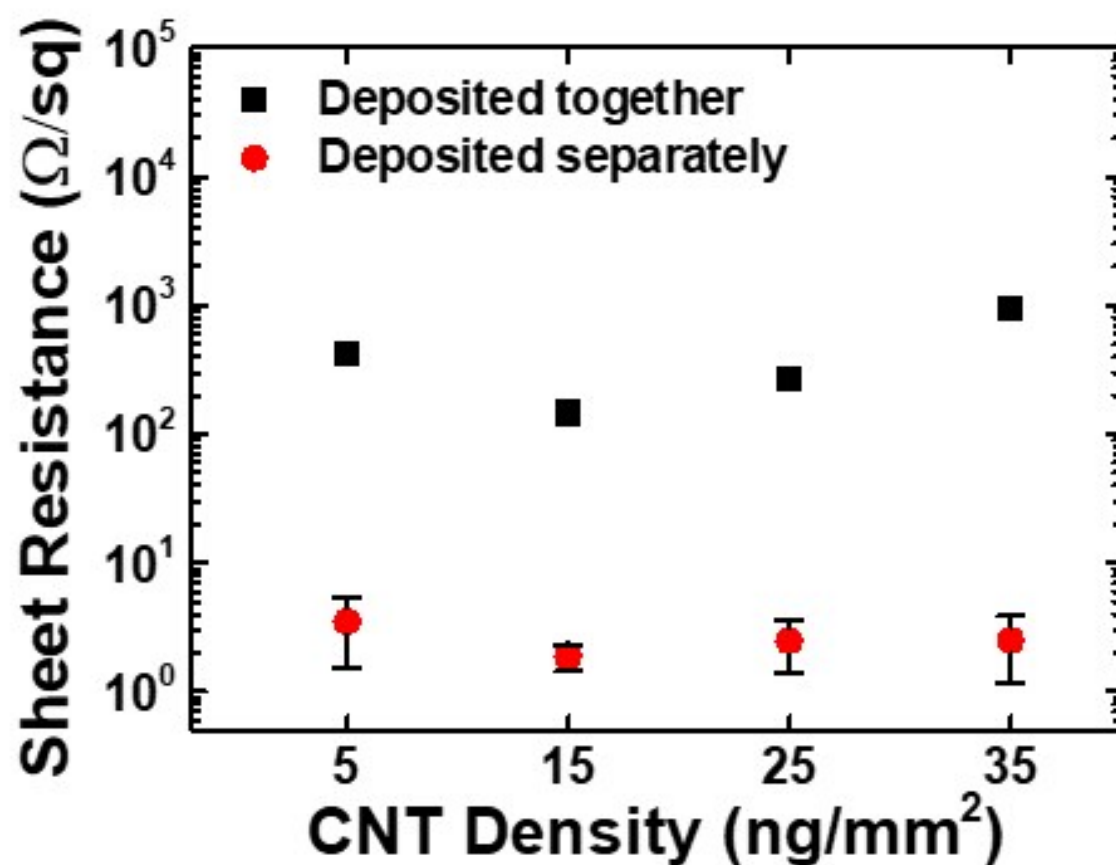


Figure S4. Sheet resistance of AgNW/CNT hybrid films via deposition using mixed solution of AgNWs and CNTs (black) and sequential deposition of AgNWs followed by CNTs (red). The latter case is lower by two orders in sheet resistance.