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SILVER NANOWIRE FABRICATION AND OPTICAL POLYDIMETHYLSILOXANE (PDMS) THIN FILM COVERING WITH THE FLEXIBLE STRAIN SENSING OF HUMAN MOTION

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In recent years, application of nanowire electrodes which have high conductivity, low resistivity, high flexibility, and transparency, is increasing in the field of electronic instruments. Textile fabric is rapidly used for producing a different kind of flexible and high electro sensor devices. In this experiment, we used a simple "Dip and Dry" method to fabricate flexible strain sensing fabric through the coating of silver nanowire (AgNW) absorbed on elastic nylon fabric to impart electrical conductivity and make a polymer electrode by covering with the optically clear polydimethylsiloxane (PDMS) thin film. The AgNWs coated fabric characterized with the scanning electronic microscopy (SEM) and the electromechanical implement and strain sensing feature of the AgNWs was researched. The mechanical properties of the fabrics did not change remarkably after the treatment. This high sensitivity of fabric was with great strain sensor, fast response, and stability. Moreover, the real-time monitoring of human motion such as bending on the finger was observed in the AgNWs fabric. The AgNWs fabric as a flexible strain sensor has the dynamic installation in wearable clothing electronic devices.

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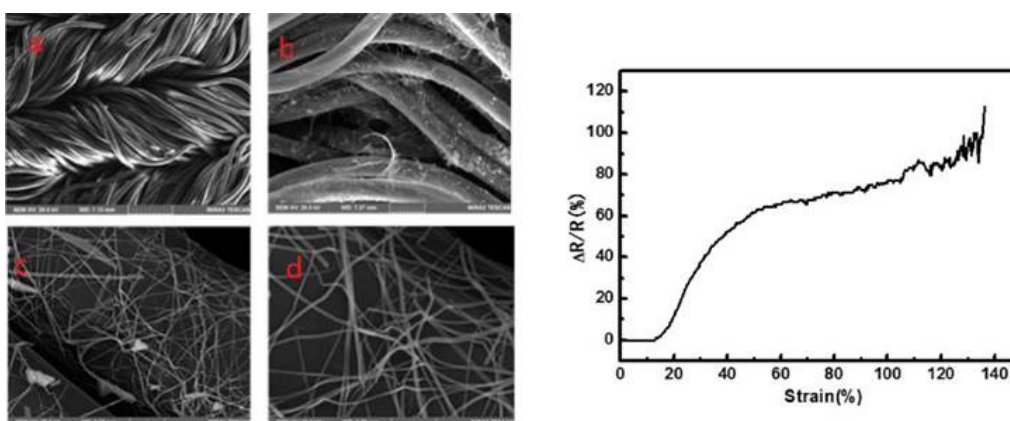


Figure: Schematic illustration and photograph of the $\Delta R/R$ % and Strain % of the fabrication and characterization of the AgNWs(a,b) AgNWs/ PDMS thin film. and optical PDMS thin film at the AgNWs fabric surface (c,d) by scanning electronic microscopy