

Single-Walled Carbon Nanotube-Polymer Composite Thin Film for Flow Sensor Application

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We report a fabrication method for a composite thin-film flow sensor including a single-walled carbon nanotube (SWCNT) network and polydimethylsiloxane (PDMS), which is immersed in deionized water and NaCl solution. The morphology of SWCNTs on the surface of the composite thin film is characterized by scanning electron microscopy. The induced voltage generated along the direction of the flowing liquid depends significantly on the liquid concentration and flow velocity. Since the SWCNTs are coated with polymer chains and fixed into the PDMS matrix, the I - V curves of the composite thin film are completely coincident before and after several flow velocity measurements, and the repeated flow-induced voltage experiment shows that the composite thin film has a reliable electrical characteristic and a wide potential of device application.

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