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Suppressed Conductance of Individual Single Walled Carbon Nanotube/Polypyrole Composite Nanowires and Their Sensing Applications XIAOLEI LIU, JAMES LY, SONG HAN, HAO CHEN, HAO ZHOU, DAIHUA ZHANG, ZHICHENG LUO, MARK THOMPSON, CHONGWU ZHOU, University of Southern California, JAMES LY COLLABORATION — We present synthesis of individual single walled carbon nanotube/polypyrrole composite nanowire by chemical vapor deposition followed by electrochemical deposition for the first time. The transport properties of the composite nanowire were studied and suppression in conduction through carbon nanotube channels was discovered and discussed. Moreover, we also demonstrated the composite nanowire devices can serve as chemical sensors, which responses to oxidizing and reducing gases. The studies on the transport of the composite and their sensing applications shed light on the interaction between the nanotubes and the electrochemically coated polymers and also opens the way toward high performance chemical/bio sensors with high selectivity.

Xiaolei Liu
University of Southern California

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