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The woven fiber organic electrochemical transistors based on polypyrrole
nanowires/reduced graphene oxide composites for glucose sensing

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Abstract

Novel woven fiber organic electrochemical transistors based on polypyrrole (PPy) nanowires and reduced graphene oxide (rGO) have been prepared. SEM revealed that the introduction of rGO nanosheets could induce the growth and increase the amount of PPy nanowires. Moreover, it could enhance the electrical performance of fiber transistors. The hybrid transistors showed high on/off ratio of 10^2 , fast switch speed, and long cycling stability. The glucose sensor based on the fiber organic electrochemical transistors have also been investigated, it exhibited outstanding sensitivity, as high as 0.773 NCR/decade, with a response time as fast as 0.5 s, a linear range of 1 nM to 5 μ M, a low detection concentration as well as good repeatability. In addition, the glucose can be selectively detected in the presence of ascorbic acid and uric acid interferences. The reliability of the proposed glucose sensor was evaluated in real samples of rabbit blood. All the results indicate that the novel fiber transistors pave the way for portable and wearable electronics devices,

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