An Oxygen Sensor based on Electrospun Carbon Nanofibers Modified with Pd Particles

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Electrospun carbon nanofibers modified with Pd sensors have been developed for O₂ sensing with high sensitivity. The average diameter of carbon nanofiber and Pd particle is about 251 and 20.5 nm, respectively. The sensing performances of the Pd decorated carbon nanofiber (Pd-CNF) electrode towards reduction of O₂ were evaluated. The Pd-CNF electrode with a Pd loading of 4.7 mg/cm² shows maximum sensitivity of 2.6 $\mu\text{A ppm}^{-1}\text{cm}^{-2}$ in the O₂ concentration region of 100-1000 ppm. The response and recovery times are less than 32 and 48 s, respectively. The high sensitivity, wide linear range and rapid response and recovery times make the Pd-CNF electrode a promising candidate for amperometric O₂ sensors.

Keywords: Pd, CNF, sensor, oxygen, electrospinning

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