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A simple and disposable carbon adhesive tape-based NO₂ gas sensor

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Research Highlights

- CAT-based gas sensor is applicable as a robust, facile, and disposable NO₂ gas sensing platform.
- Electrical conductance of CAT chip is increased depending on the exposure time (0-10 min) and concentration (0-100 ppm) of NO₂ gas.
- Detection time of NO₂ gas is less than 3 min with enough sensitivity (~5 ppm) which is lower than the concentration generally considered as a minimum concentration (10 ppm) to cause harm to human.
- CAT chip can detect NO₂ gas from the car exhausts such as gasoline and diesel regardless of humidity (H₂O), carbon dioxide (CO₂), nitrogen (N₂) and dust.

ABSTRACT

Nitrogen dioxide (NO₂) is one of the toxic gas that causes debilitating disease in the respiratory system. Due to imprudent industrial development, the need for a facile and sensitive gas detection has been grown. Here, we develop a simple and disposable NO₂ gas sensor employing carbon adhesive tape (CAT) as the gas detection element. The CAT developed in this study contained a large amount of carbon black material to adsorb NO₂ gas molecules. Experiments revealed that the gas molecules were bound rapidly

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