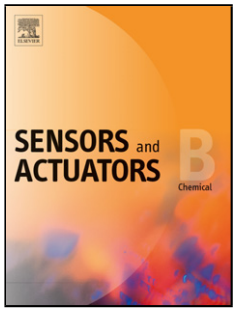

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A simple and disposable carbon adhesive tape-based NO_2 gas sensor

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Research Highlights

- CAT-based gas sensor is applicable as a robust, facile, and disposable NO_2 gas sensing platform.
- Electrical conductance of CAT chip is increased depending on the exposure time (0-10 min) and concentration (0-100 ppm) of NO_2 gas.
- Detection time of NO_2 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 NO_2 gas from the car exhausts such as gasoline and diesel regardless of humidity (H_2O), carbon dioxide (CO_2), nitrogen (N_2) and dust.

ABSTRACT

Nitrogen dioxide (NO_2) 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 NO_2 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 NO_2 gas molecules. Experiments revealed that the gas molecules were bound rapidly