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A Solid State Sensor for Improvised Peroxide Explosives Detection

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Background

Terrorism has become a pervasive global problem. The most popular devices used by terrorists are improvised peroxide explosives. These devices are constructed from common chemicals that are readily available all over the world and are also very inexpensive to purchase. Additionally, it is very difficult to detect these devices because there are so many products in everyday use that contain peroxide. Sensors made from Titania nanotubes, however have proven to be effective detectors for peroxide explosives. Unfortunately, these devices are easily damaged and become useless when they come in contact with moisture and saline vapor as is found in the atmosphere along coastal areas and ports.

Invention Description

Researchers at Arizona State University have developed an improvement to Titania nanotube sensors used for the detection of improvised peroxide explosives. The innovation is a 10-12 nm thick surface coating which provides a barrier to moisture and saline vapors, thus preventing environmental damage to the sensor. The coating does not adversely affect the detection ability of the Titania nanotubes. Furthermore, the innovation improves the manufacturing process of the sensors, allowing for smaller detectors to be manufactured more quickly. The modified production process represents a significant improvement in the production and fabrication process.

Potential Applications

- Explosives detectors for use in coastal areas for boarder protection
- Military application to protect troops in hostile territory
- Devices can be used for security in air traffic
- Secure sporting events and large gatherings

Benefits and Advantages

- **Lower Costs** – Allows for faster, less expensive manufacturing process
- **More Reliable** – Prevents damage to devices or inaccurate reading due to atmospheric conditions
- **Saves Lives** – Early detection of explosive devices allows for pre-emptive action which can lower causality rates.