Sensitive Chemical Sensor To Detect A Broad Range Of Nitrogen-Based Explosives

Tech ID: 20583 / UC Case 2007-074-0

BACKGROUND

Detecting ultra trace explosive analytes is important for forensic or counterterrorism applications as well as for personnel, baggage, or cargo screening. However, metal detectors frequently fail to detect explosives (such as those in the plastic casing of modern land mines); dogs are expensive and difficult to maintain: and other methods, including gas chromatography coupled with mass spectrometry, surface-enhanced Raman, energy dispersive X-ray diffraction, for example, are highly selective, but are expensive and not easily adapted to a small, low-power package. Therefore, chemical sensors are preferable to other detection devices.

TECHNOLOGY DESCRIPTION

This technology describes the synthesis of a polymer and a method for detecting a broad range of nitrogen-based explosives including nitraromatic based, nitramine based and nitrate ester-based high explosives. The polymer is excited at an appropriate range using a UV-B, UV-C, black light, LED or other illumination source. If an explosive has bound the polymer, then the polymer fluorescence will be quenched.

APPLICATIONS

- Counter terrorism
- Forensic (e.g. examination of post blast residue)
- Screening baggage, personnel, or cargo
- Facility protection

ADVANTAGES

- Sensitve
- Rapid
- Low cost
- Versatile synthetic approach
- Single polymer
- Detects wide range of trace explosives
- Detects explosives on a variety of surfaces

STATE OF DEVELOPMENT

This technology is the subject of a patent application, and is being offered exclusively or nonexclusively for US and/or worldwide territories.

There is an initial working prototype.

RELATED MATERIALS

- Dr. William Trogler, Professor of Chemistry & Biochemistry, UCSD.
- Trogler Group Web Page
- S. J. Toal and W.C. Trogler, "Polymer Sensors for Nitroaromatic Explosives," Journal of Materials Chemistry 16, 2871-2883 (2006)

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	8,557,595	10/15/2013	2007-074

CONTACT
University of California, San Diego
Office of Innovation and Commercialization
innovation@ucsd.edu
tel: 858.534.5815.

OTHER INFORMATION

KEYWORDS

nitrogen, detection, sensor, screening, polymer

CATEGORIZED AS

- **Materials & Chemicals**
  - Chemicals
  - Other
- **Sensors & Instrumentation**
  - Analytical
  - Other

RELATED CASES

2007-074-0

University of California, San Diego
Office of Innovation and Commercialization
9500 Gilman Drive, MC 0910, ,
La Jolla,CA 92093-0910

Tel: 858.534.5815
innovation@ucsd.edu
https://innovation.ucsd.edu
Fax: 858.534.7345