TITLE PROCEDURE FOR THE PREPARATION OF COMPOUNDS THAT COULD BE APPLIED TO DETECT OXIDANT EXPLOSIVES

DESCRIPTION OF THE TECHNOLOGY

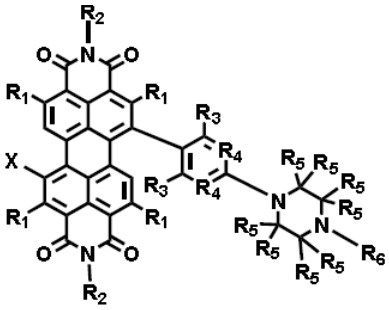
Triacetone triperoxide (TATP) is a powerful explosive without military utility because of their sensitivity to mechanical impact. However, it is widely used by terrorists because of their easy preparation and their difficult tracking by explosive-detector dogs, which are trained to identify nitrogen-based explosives. The possibility of in situ preparation is the origin of the restrictions on carrying liquids in hand luggage at airports. All of this gives an idea of the deep daily impact provoked by TATP in the lives of millions of human beings.

The search for a specific portable fluorogenic probe for easy and direct detection of TATP, rather than the indirect detection of their decomposition products, without the use of large and expensive equipment is an unsolved problem.

It would therefore be desirable to have a specific method for the easy and direct detection of TATP. It would also be desirable for the method to be simple and portable for rapid implementation in any place.

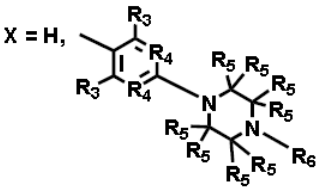
The technology presented in the invention is based on perylenediimides (PDIs) substituted in 1- or 1- and 7- positions by specific nitrogen substituents. These compounds have many of the desirable properties, such as a quenched fluorescence which is recovered in the presence of oxidizing molecules (including TATP), and high chemical and optical stabilities, allowing their use in the detection of such molecules (including TATP).

Thus, the present invention relates to the design and preparation of a compound or mixtures of compounds PDI (I) with suitable substituents to be used as an adequate detector of oxidant agents and particularly to detect explosives like TATP.



I

donde:



MARKET APPLICATION SECTORS

Security Sector. Prevention of terrorist attacks

TECHNICAL ADVANTAGES AND BUSINESS BENEFITS

This new technology allows the simple and direct detection of oxidant explosives, so it could be used in critical facilities, such as access controls of airports.

CURRENT STATE OF DEVELOPMENT

Developed at laboratory scale. It requires further development for commercialization or industrial establishment.

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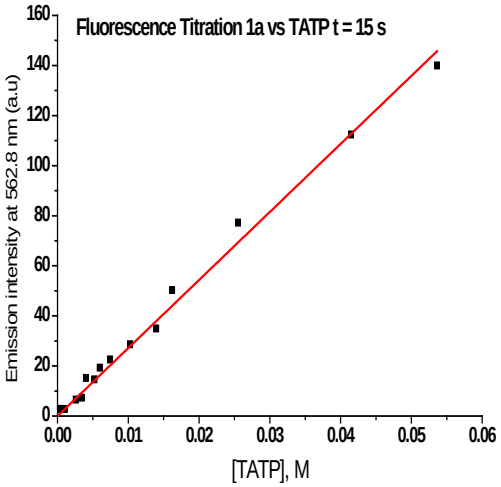
INTELLECTUAL PROPERTY RIGHTS

Protected by patent in Spain. Miguel Hernández University of Elche owns 57.14 % of patent rights. The remaining 42.86 % is held by the University of Burgos.

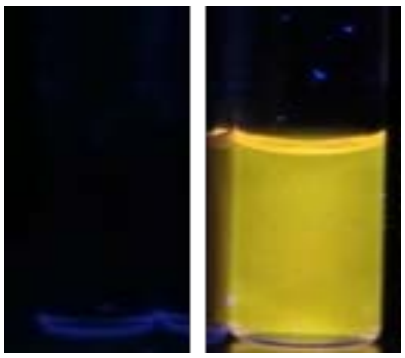
COLABORATION SOUGHT

License agreements with companies interested in commercializing the technology.

RELATED IMAGES



Fluorescence titration of **1a** with TATP (5 x 10^{-6} M, $CHCl_3$:MeOH 9:1 v/v, 0 to 10^4 equivalents of TATP)



Fluorescence of **1a** (10^{-5} M, $CHCl_3$:MeOH 9:1, 0.5 mL) (left) and after addition of 10 mg of TATP (right)

CONTACT

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