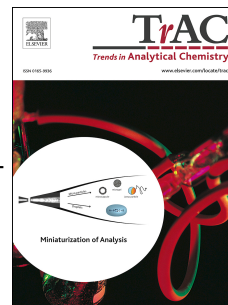


Accepted Manuscript

Recent Developments in the Electrochemical Detection of Explosives: Towards Field-Deployable Devices for Forensic Science

Holly A. Yu, David A. DeTata, Simon W. Lewis, Debbie S. Silvester



PII: S0165-9936(17)30267-4

DOI: [10.1016/j.trac.2017.10.007](https://doi.org/10.1016/j.trac.2017.10.007)

Reference: TRAC 15025

To appear in: *Trends in Analytical Chemistry*

Received Date: 24 July 2017

Revised Date: 10 October 2017

Accepted Date: 10 October 2017

Please cite this article as: H.A. Yu, D.A. DeTata, S.W. Lewis, D.S. Silvester, Recent Developments in the Electrochemical Detection of Explosives: Towards Field-Deployable Devices for Forensic Science, *Trends in Analytical Chemistry* (2017), doi: 10.1016/j.trac.2017.10.007.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Recent Developments in the Electrochemical Detection of Explosives: Towards Field-Deployable Devices for Forensic Science

Holly A. Yu^{a,*}, David A. DeTata^b, Simon W. Lewis^a and Debbie S. Silvester^{a,*}

^a*Curtin Institute of Functional Molecules and Interfaces & Department of Chemistry, Curtin University,
GPO Box U1987, Perth, WA 6845, Australia*

^b*Forensic Science Laboratory, ChemCentre, Manning Road, Bentley WA 6102, Australia*

* Corresponding authors. E-mail addresses: holly.yu@postgrad.curtin.edu.au (H.A. Yu), d.silvester-dean@curtin.edu.au (D.S. Silvester).

Abstract

The identification and transportation of trace explosive residues following the detonation of an explosive device or during an explosive related criminal investigation is a crucial yet often time consuming process. The ability to detect explosives at or near an explosion scene therefore offers considerable time advantages in the investigation. For this reason, the development of field-deployable portable analytical instruments is an active area of research. This review explores the potential use of electrochemical sensors for in-situ trace explosives detection. A key focus of this review article is the use of room temperature ionic liquids (RTILs) for the electrochemical detection of explosives. The review compares reaction mechanisms for the electrochemical reduction of TNT in aqueous solutions and in RTILs, before a discussion is made on recent work investigating explosives detection in aqueous, non-aqueous and RTIL-based samples. Finally, commentary is made on the anticipated future direction and challenges of this field.

Keywords

Explosives detection; aqueous solutions; organic solvents; room temperature ionic liquids; electrochemistry; cyclic voltammetry; square wave voltammetry; electrochemical sensors.

Download English Version:

<https://daneshyari.com/en/article/7688134>

Download Persian Version:

<https://daneshyari.com/article/7688134>

[Daneshyari.com](https://daneshyari.com)