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Review article

Colorimetric Sensor Arrays for the Detection and Identification of Chemical Weapons and Explosives

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Abstract

There is a significant demand for devices that can rapidly detect chemical-biological-explosive (CBE) threats on-site and allow for immediate responders to mitigate spread, risk, and loss. The key to an effective reconnaissance mission is a unified detection technology that analyzes potential threats in real time. In addition to reviewing the current state of the art in the field, this review illustrates the practicality of colorimetric arrays composed of sensors that change colors in the presence of analytes. The review also describes an outlook towards future technologies, and describes how they could possibly be used in areas such as war zones to detect and identify hazardous substances.

Keywords: Colorimetric arrays, chemical detection, explosives, principal component analysis, field testing, handheld devices, smartphone technology, Red Green Blue (RGB) analysis,

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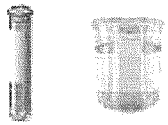
Summary

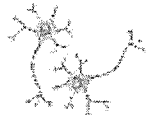
UCC
Coláiste na hOllscoile Corcaigh, Éire
University College Cork, Ireland

Goal is to develop miniaturised devices and systems that are simple, label-free, sensitive, and developed according to end user requirements.

System Integration
"Lab-on-chip"

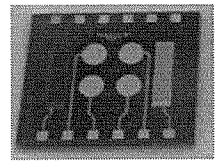

Cell Cultures


Human Samples
(Blood, Urine, Saliva)


Cells

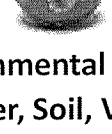

Antibodies


Electrodes


Sensors

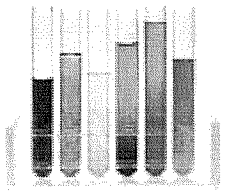
Range of applications:

- Health
- Drug/Cosmetics
- Food/beverage QC
- Environmental monitoring
- Security (CBRN)
- Process Analytical Technology (PAT)
- Forensic Science


Environmental Samples
(Air, Water, Soil, Vegetation)


Food Samples


Enzymes


(Reach Directive)



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