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Ion Mobility Spectrometry: Current Status and Application for Chemical Warfare Agents Detection

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Highlights

- Ion mobility spectrometry is the method for chemical warfare agents on-site detection
- Limits of detection of low ppb level are achieved
- Different kinds of detectors are used for analysis
- Combined methods of measurement improve selectivity of detection

Abstract

The important application of the ion mobility spectrometry (IMS) is the detection of very toxic compounds classified as chemical warfare agents (CWAs). IMS is the main technique applied in the instruments designed for on-site analysis of CWA. Different kinds of instruments based on IMS have been described analyzing their sensitivity and resolving power. Physical fundamentals of the operation principles as well as construction of detectors have been discussed. The article contains the review of the most important publications concerning the application of IMS in detection of CWAs including the new directions of development and future prospects. The data of the most classic CWAs containing values of reduced mobilities of ions generated from the molecules of these substances have also been presented.

Keywords

ion mobility spectrometry, differential mobility spectrometry, chemical warfare agents, on-site detection, hazardous materials

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