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Seeking Universal Detectors for Analytical Characterizations

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Highlights

- Universal detectors that can detect all types of compounds and give uniform response regardless of their physicochemical properties are highly desirable
- Reviewed commonly used detectors in analytical characterization, including UV, RI, ELSD, CAD, CLND, FID, VUV, MS, NMR, etc. and hyphenated detection
- Focused on the "universal" features of these detectors

Abstract

It is highly desirable to have a universal detector that can detect all types of compounds and give a uniform response regardless of the physiochemical properties of the compounds. With such a universal detector, all components in a sample can be accurately quantified without the need for individual standards. This is especially needed for the characterization of unknowns and for non-targeted analysis, or for samples that have no isolated standards available for each component. Over the years, much effort has been put into seeking a universal detection technology. In this review, we discuss the commonly used detectors for analytical characterization, including UV, RI, ELSD, CAD, CLND, FID, VUV, MS, NMR, and hyphenated detection, with the focuses on the "universal" features of these detectors regarding the types of molecules they can detect and the uniformity of responses.

Abbreviations

APCI	Atmospheric pressure chemical ionization
APPI	Atmospheric pressure photo ionization
CAD	Charged aerosol detector
CI	Chemical ionization
CLND	Chemiluminescent nitrogen detector
DAD	Diode array detector
DHA	Docosahexaenoic acid