Comunicaciones

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Advances in Atmospheric Pressure Gas Chromatography (APGC) for the analysis of persistent organic pollutants (POPs); background and applications

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Abstract

Gas chromatography coupled to mass spectrometry (GC/MS) has been extensively applied for determination of volatile non-polar compounds in many applied fields including food safety and environmental analysis.

To date, the analysis of dioxins and dioxin-like compounds is most often performed on high resolution GC (HRGC) magnetic sector instruments as required by the various legislative bodies (USEPA, EU & MOE Japan). In the near future a change to the EU regulations is expected and this change will allow for a more diverse range of instruments to be used for the analysis, including the potential for GC tandem quadrupole MS.

One technique that has potential for GC amenable compounds is atmospheric pressure gas chromatography (APGC). A significant advantage of this technique is that it produces ionisation that is comparable to atmospheric pressure chemical ionisation (APCI). This means that APGC is a much softer ionisation technique compared to electron ionisation (EI) therefore, a considerably higher abundance of the molecular ion is detected. This has significant benefits for sensitivity and selectivity. Another advantage being that this technique can be also used on an electrospray instrument with UPLC. The changeover between techniques is simple and fast with no compromise in data quality.

An APGC source coupled to a Xevo TQ-S was used to analyse dioxins, polychlorinated biphenyls (PCBs) and brominated flame retardants (PDBEs). Data is shown including, linearity, sensitivity and repeatability. The advanced features of the XEVO TQ-S (RADAR) are also shown.

This data illustrates that the APGC is a highly sensitive, robust and flexible technique with significant advantages for the future of POPs analysis.