ASAP-IMS-MS shows the potential to fingerprint crude oil samples, and offers a route to the analysis of involatiles, which cannot be achieved using GC/MS.
THE SOLUTION

Direct sample introduction of a crude oil sample and ionization was performed using the ASAP technique with the SYNAPT G2 HDMS Mass Spectrometer. The conventional Tof-MS spectrum obtained is extremely complex, as shown in Figure 1.

When using ion mobility separation, bands separated by 14 Da (CH2) are visualized, as shown in Figure 2A. By selecting the bands shown in Figure 2B, it is possible to extract the ion mobility mass spectrum and export it into MassLynx™ Software for further interpretation, as shown in Figure 3.

Ion mobility separation (IMS) combined with direct ionization using the ASAP has previously been illustrated. The orthogonality of IMS acts as an enabling technology where crude oil sample analysis can be performed with no prior chromatographic separation or sample preparation. The combination of ASAP-IMS-MS shows the potential for this technique to fingerprint crude oil samples, and offers a route to the analysis of involatiles, which cannot be achieved using GC/MS. Useful information was readily extracted from complex data using DriftScope™ Mobility Environment Software v.2.1.

SUMMARY

- ASAP provides an easy and quick means to introduce a sample and produce screening data, without the constraints caused either by chromatographic conditions, or by ionization solvent compatibility.
- Ion mobility brings an additional dimension to the analysis of complex samples such as crude oil.
- The potential to separate isomers can simplify the mass spectra, and facilitates the characterization of complex samples.
- IMS-MS extends the capability of direct ionization techniques.

Reference


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