

MSD Direct Inlet Probe DIP – Application Note

(DIP-A01A)

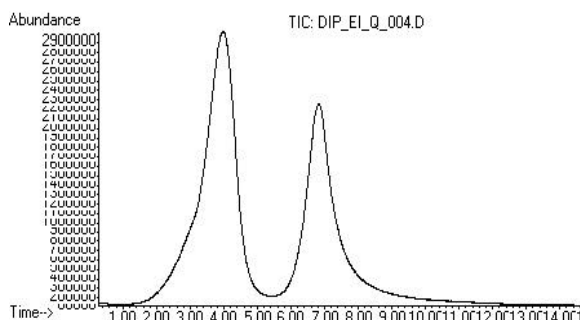
Analysis of a triglyceride mixture with MSD (EI mode) and DIP

The direct inlet probe (DIP) is a useful instrument for fast analysis of solid and liquid samples with a mass sensitive detector (MSD). This system was developed by SIM GmbH for use on the Agilent 5973/5975 MSD – without uncoupling the GC/MS interface! Now it is possible to switch from MS-DIP to GC/MS and vice versa without venting the MSD.

The push rod can be heated to 400°C at 0.1 to 2°C/s. Up to three temperature ramps can be entered into the DIP software. As the heating takes place in the MSD vacuum, the boiling points are decreased, and even the analysis of solid samples leaves no residue.

Slow heating of the push rod can be used to separate analytes with different boiling points. This is shown with a triglyceride mixture. As seen in the graph (Fig. 1), the triglycerides tricaprin and tripalmitin are beautifully separated (TIC) and the analytes can be identified by their EI mass spectra.

Analysis was done with the DIP probe tip for liquid samples:



Sample: mixture of tricaprin (b.p. 30°C) and tripalmitin (b.p. 65-68°C) in hexane/acetone (9:1)
 MS: Agilent 5973 MSD, EI mode
 DIP mode: heating rate 1°C/s

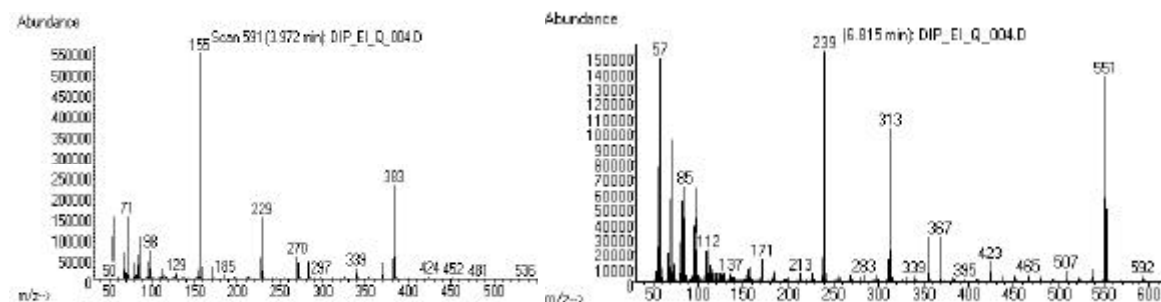


Figure 1: Total Ion Chromatogram (TIC – on top) and mass spectra of triglyceride mixture (bottom, tricaprin left, tripalmitin right)

In more complicated mixtures, the DIP can be used for preliminary **screening** of samples before choosing the ones to be analyzed with a time-consuming GC run.

To improve the efficiency and save even more time, the DIP can be operated in combination with a PAL autosampler. Together with the special DIP/PAL accessories **automated analysis** of liquid and solid samples is possible.

Figure 2: Agilent MSD 5975 with DIP, GC and CombiPal autosampler

