

Coupling of planar chromatography with mass spectrometry - comparison of three approaches (DART, ESI and APGD)

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Recent approaches for extraction or desorption of substances directly from a HPTLC plate enable sensitive mass spectrometric signals within one minute or even within seconds. The presented techniques – compared to other approaches - allow mass selective detection on silica gel phases in the pg-range.

DART (Direct Analysis in Real Time) was introduced 2005 [1]. This kind of versatile new ion source is working in open air under ambient conditions. The employment of DART in the field of planar chromatography was successfully demonstrated in initial studies [2]. Detectability was shown in the low ng-range on the example of isopropylthioxanthone, a photoinitiator known as a new food contaminant (Figure 1). Analytical response and reproducibility were strongly dependent from proper positioning of the HPTLC/TLC plate into the charged gas stream of the ion source.

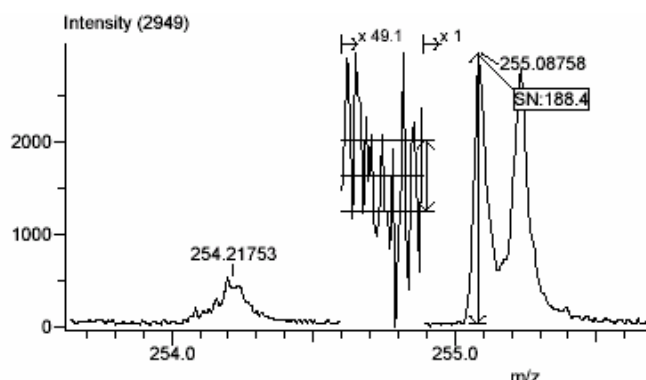


Figure 1 HPTLC/DART-TOF spectrum of 3.2 ng ITX zone at m/z 255.08758 with a S/N ratio of 188

This new hyphenation was compared to a plunger-based extraction device for HPTLC/ESI-MS [3] which employment was recently demonstrated in trace analysis [4]. LOQ was found to be 96 pg. Reproducibility was 6.7 %, analytical response showed a determination coefficient r^2 of 0.9983. Spatial resolution was 2 mm.

As latest approach planar chromatography was coupled with mass spectrometry via atmospheric pressure glow discharge (APGD). Recent results obtained by this coupling were presented and discussed.

Literature

- [1] R. Cody, J. Laramée, H. Dupont Durst, *Anal Chem* 77 (2005) 2297-2302
- [2] G. Morlock, 2006 in submission
- [3] H. Luftmann, *Anal Bioanal Chem* 380 (2004) 964-968
- [4] G. Morlock, W. Schwack, *Anal Bioanal Chem* 385 (2006) 586-595