Application Note No. 105

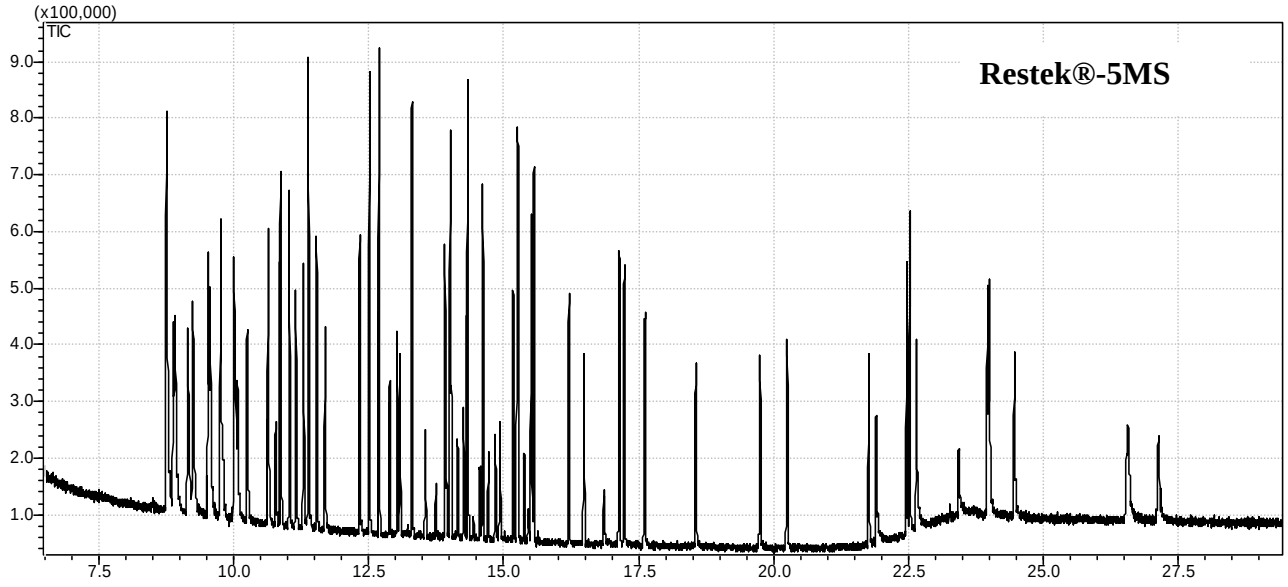
Comparison of two GC-columns for analysis of pesticides for the US EPA 8270 method, Rtx®-5MS and Inertcap-pesticides©.

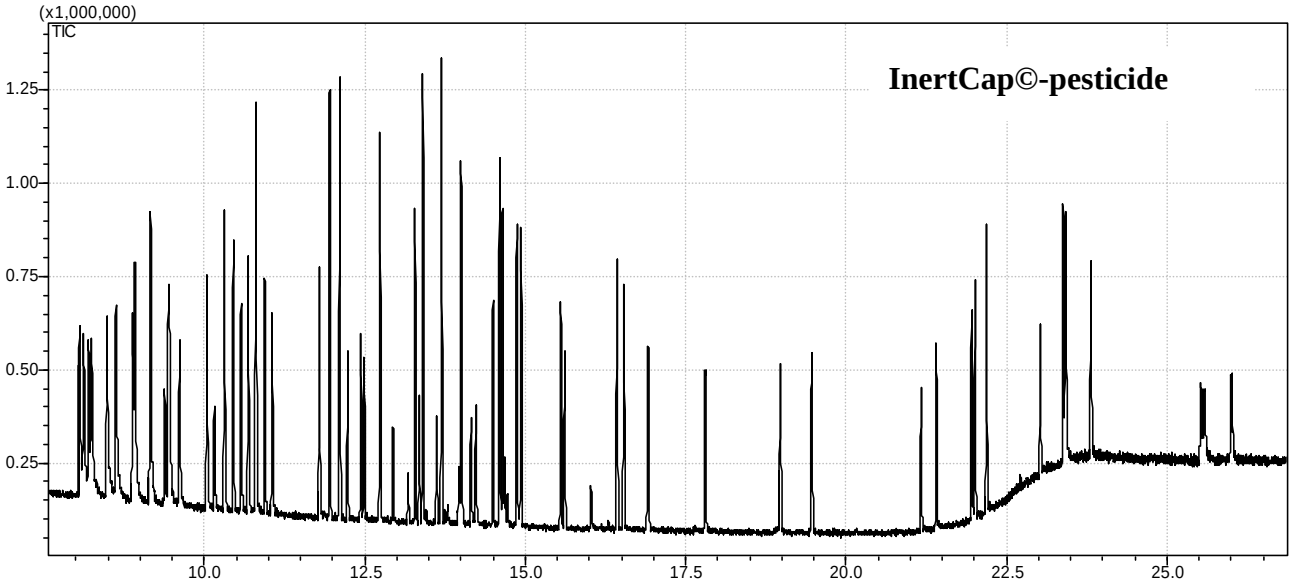
Key Words: Pesticides, Optic 3, EPA 8270, GC-columns

Introduction:

Nowadays it is still necessary to improve the methods for screening of large amounts of pesticides in just one single GC-run. The mass-spectrometer can separate pesticides based on differences in the mass-spectrum but we still need more separation. For this reason a special GC-column is developed for the screening/analysis of large amounts of pesticides: The InertCap-pesticide. The better peak shapes and the higher separation power of the special pesticide column result in lower detection limits and it will be easier to integrate the peaks. To demonstrate the performance of the new column, the Restek Megamix for the EPA 8270 method was analysed on two columns: the most commonly used column for pesticide analysis, the Restek-5MS and the new developed InertCap-pesticide.

Results:





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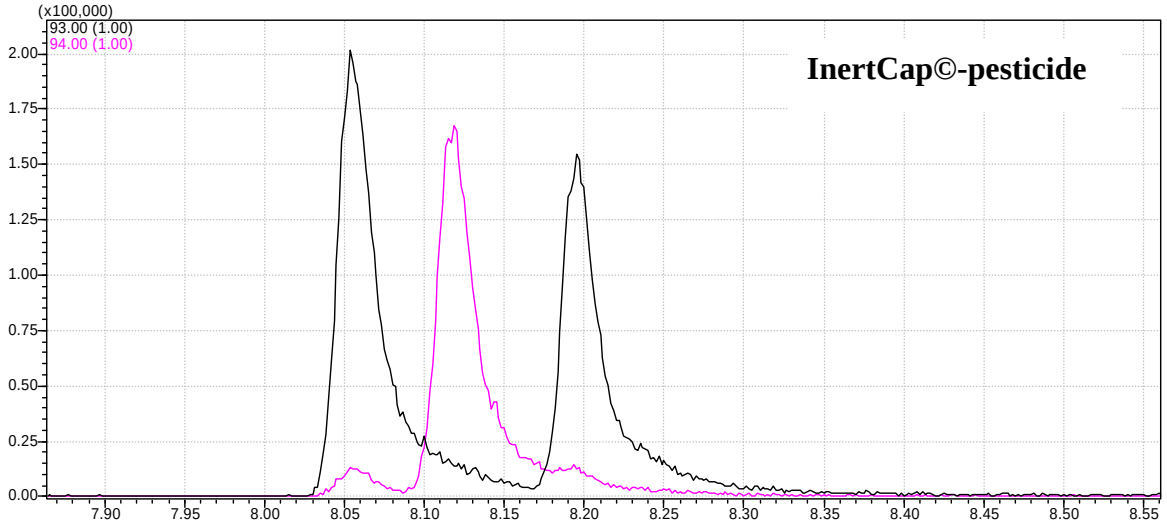
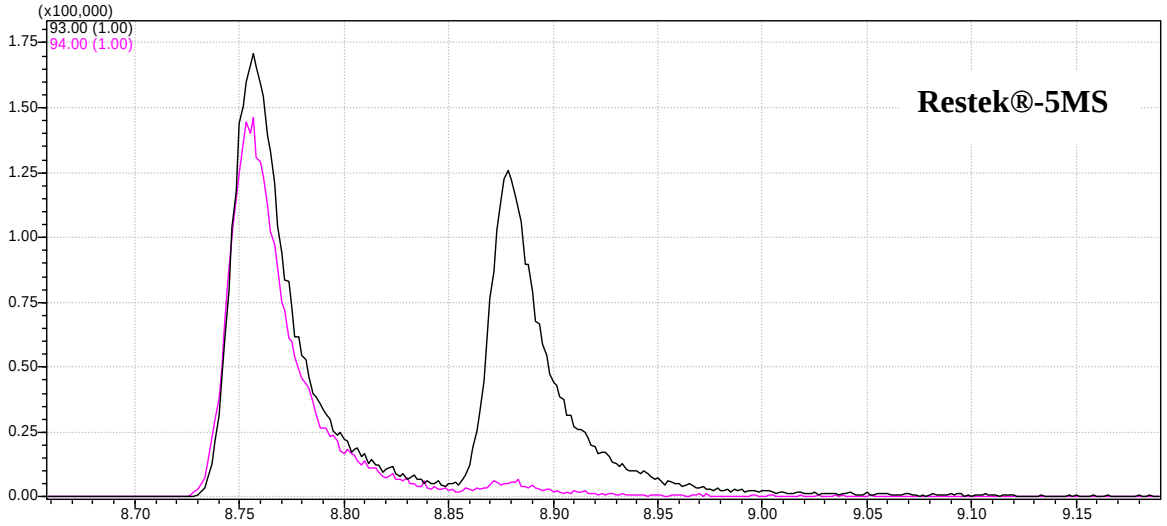
Separation of the critical pairs:





Phenol, Aniline and bis(2-Chloroethyl) ether (m/z 93 and m/z 94)

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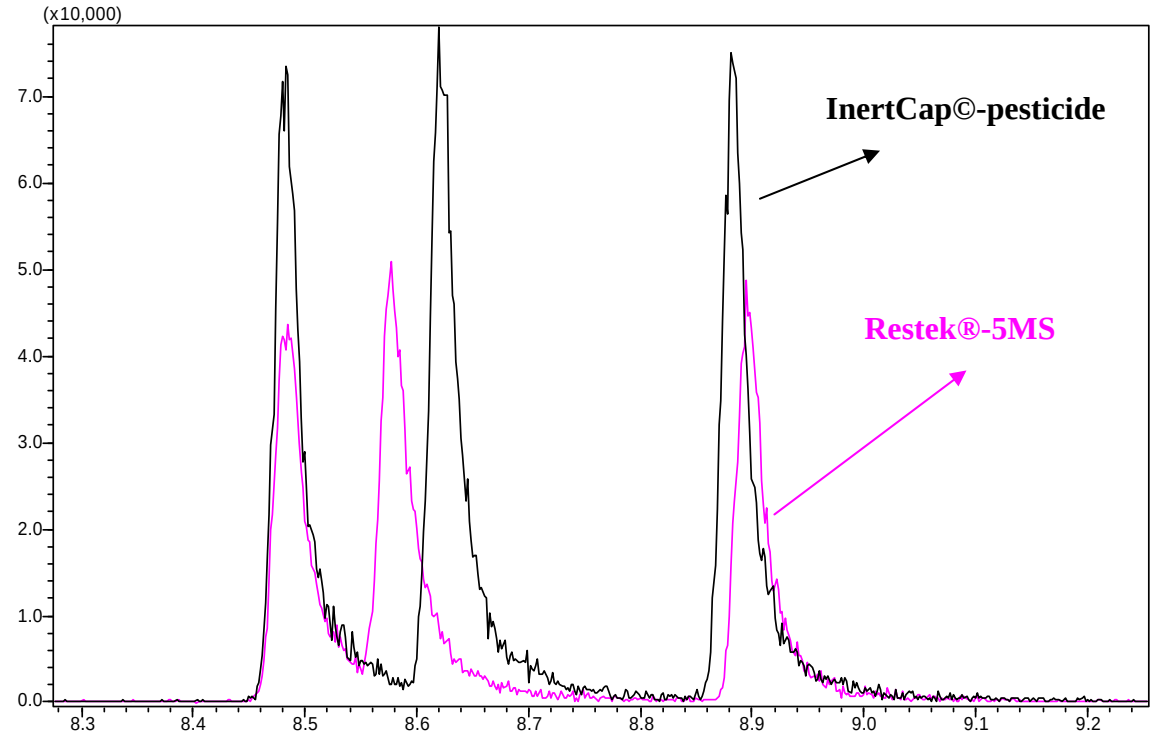
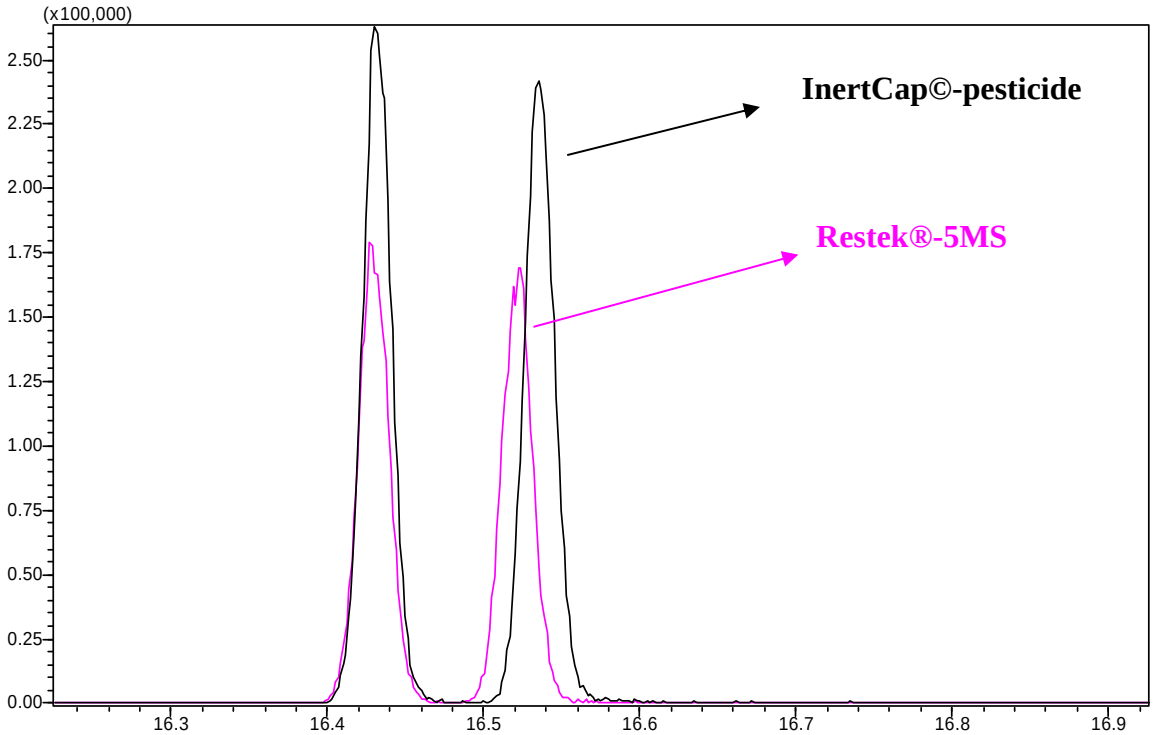


1,3-Dichlorobenzene, 1,4-Dichlorobenzene and 1,2-Dichlorobenzene



Phenanthrene and Anthracene

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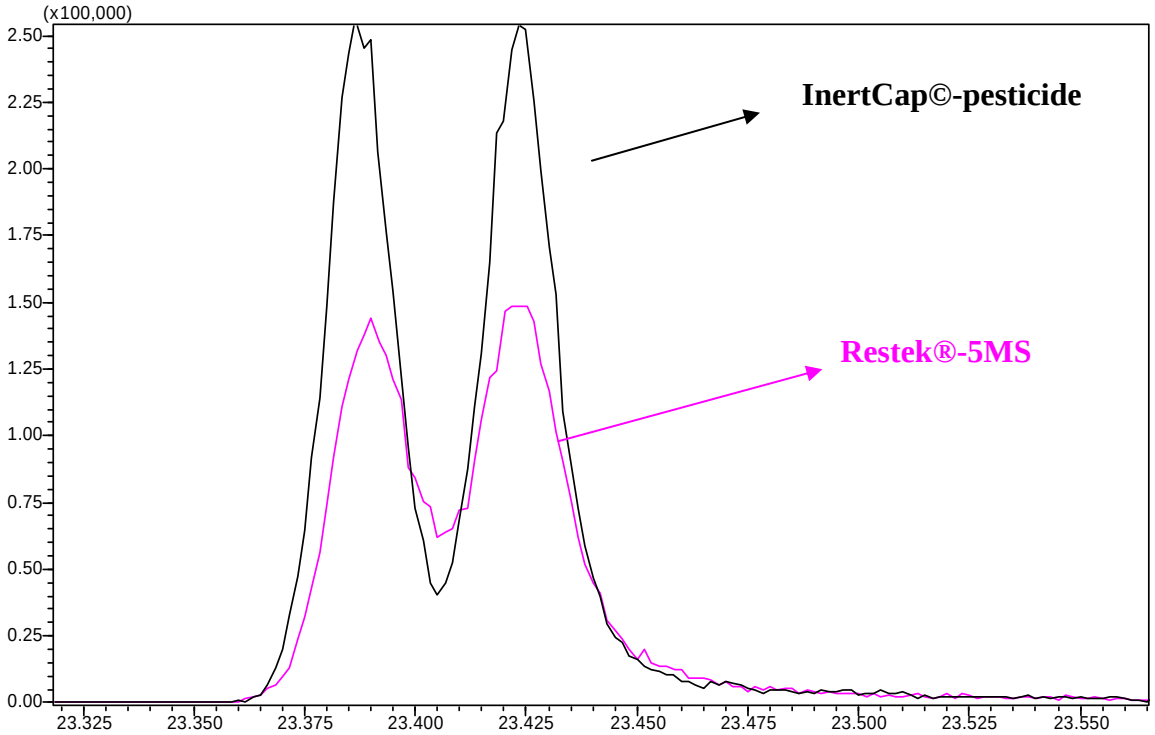

Benzo(b)Fluoranthene and benzo(k)Fluoranthene

Experimental:

Column 1.: Restek®-5MS (30 m, 0.25 mmID. 0.25 µm df)
Column 2.: InertCap-pesticides (30 m, 0.25 mmID. similar df)
Megamix 8270 1000 ng/µl (Cat no. 31850, Restek)

Oven Temp.: 50 °C (4.5 min hold)⟶ 175 °C (15 °C/min)⟶ 250 °C (10 °C/min) ⟶310 °C (30 °C/min)
Injection: Temp: 250 °C;
Injection mode: splitless (3 min.);
Injection volume: 1 µl (1 ng/µl 8270 pesticide mix)
Flow rate carrier gas: 1.2 ml/min (Helium)

Discussion:

It is clear form the figures that the performance of the new developed InertCap-pesticide column is much better than the conventional Restek-column. The InertCap-pesticide column can be used for faster analysis, better or easier integration of the peaks and/or it results in lower detection limits due to the smaller peaks. Therefore, the use of this new column is an easy step towards an improved performance of an pesticide application.

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