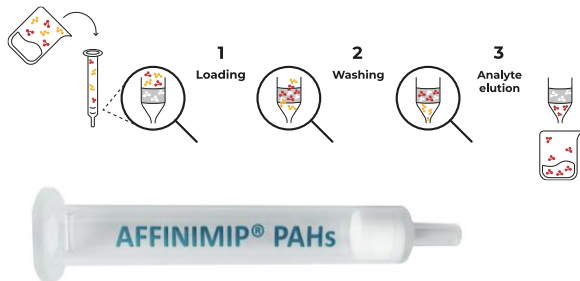
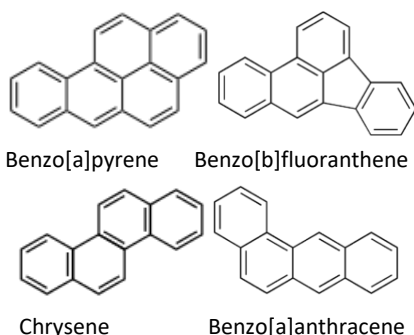


## PAHs Analysis in Colza oil using AFFINIMIP®SPE PAHs



### Polycyclic aromatic hydrocarbons: a major concern for human health and a challenge in food safety analysis

Polycyclic aromatic hydrocarbons (PAHs) are a large group of organic compounds with two or more fused aromatic rings and are known to be cancer causing agents. Human beings are exposed to PAHs mostly by intake of food. As these compounds are highly soluble in lipophilic compounds, edible oils can be an important source of contamination by PAHs.



**Figure 1.** Chemical structure of regulated PAHs

In 2011, EU Commission Regulation No 835/2011, amending Regulation 1881/2006, set maximum levels in edible oils to 2 ng/g of benzo[a]pyrene individually, and 10 ng/g of benzo[a]pyrene, benzo[b]fluoranthene, chrysene and benzo[a]anthracene combined.

### How to solve this?

AFFINISEP has developed a new class of intelligent polymers based on molecularly imprinted polymers (AFFINIMIP®). AFFINIMIP® SPE PAHs cartridge is a simple, fast, sensitive and selective tool for the extraction of PAHs (including benzo[a]pyrene, benzo[b]fluoranthene, chrysene and benzo[a]anthracene) from fatty foods such as oil.

In this application note, we demonstrate a reliable quantification of these PAHs from colza oil using a new format of AFFINIMIP® SPE PAHs with an LC-Fluo analysis suitable for routine analysis. In comparison with olive oil, colza oil has a much higher content of polyunsaturated fatty acid (around 30%).

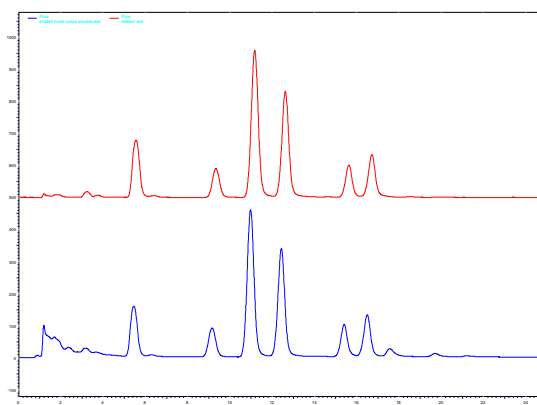
We obtained good recovery yields with a fluorescence detection proving the efficiency of AFFINIMIP® SPE PAHs cleanup. A 14 mixed standards of PAHs has been used for spiking colza oil.

### Good recoveries in colza oil

Molecules	R%
Benz[a]anthracene	105
Chrysene	92
Benzo[b]fluoranthene	85
Benzo[a]pyrene	82

**Table 1.** Recovery of main PAHs after AFFINIMIP® SPE PAHs clean-up of colza oil spiked at concentration doped at 5µg/L for each PAH.

**Figure 1.** Fluo Chromatogram (blue) obtained after clean-up with AFFINIMIP® SPE PAHs of colza oil spiked at 5µg/L with a 14 mixed standard PAH (from Dr.Ehrenstorfer). Red Chromatogram is the standard injected at same concentration.



### Experimental conditions

#### *Materials*

All reagents and chemicals were ACS grade quality or better. Colza oil was purchased at a supermarket.

#### *Solid phase extraction (SPE) protocol*

The SPE procedure used a 3mL **AFFINIMIP® SPE PAHs** cartridge. The details of each step are as follow:

#### **Conditioning/Equilibration :**

- 3 mL Ethyl acetate/cyclohexane (50/50, v/v)
- 3mL cyclohexane

#### **Loading :**

- Load 2mL of the colza oil diluted by 5 or 10 with cyclohexane (0.5 drop/s)

#### **Washing :**

- Wash the cartridge with 3 x 4 mL of cyclohexane/ 0.5% Ethyl acetate (1 drop/s)

#### **Elution :**

- Elute PAHs with 10 x 3mL Ethyl acetate/ cyclohexane 5-95 (1 drop/s) or 5x 3mL Ethyl acetate/ cyclohexane 10-90 (1 drop/s). The elution fraction was then evaporated and dissolved in acetonitrile (0.5mL).

#### *Analysis*

HPLC was performed on a ThermoFinnigan Spectra System with an Agilent PAH column (50mm x 4.6mm; 1.8µm). Mobile phase at 85 ACN 15 H2O with a flow rate of 0.5mL/min.

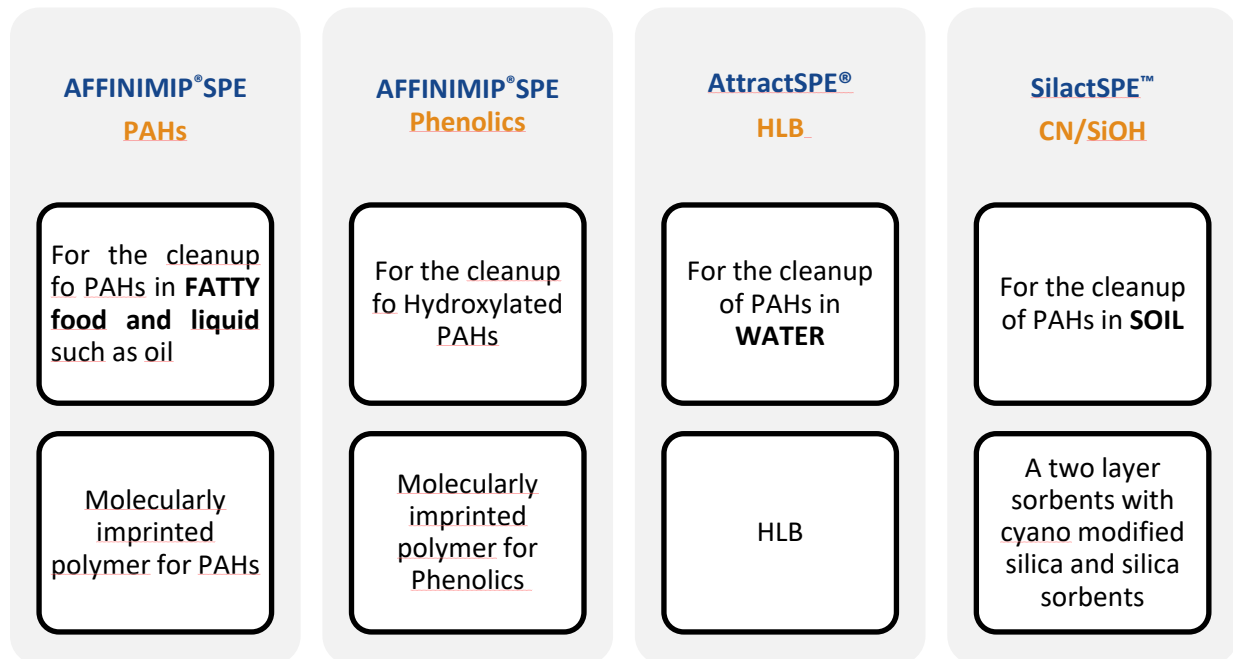
The detection system was a Fluorimeter Jasco FP2020 plus (λex/em 290/430nm). The injection volume was 50µL.

#### Product reference

- **AFFINIMIP® SPE PAHs**

Catalog number: FS119-03 for 50 cartridges - 3mL

## SPE for Polycyclic Aromatic Hydrocarbons (PAHs)



Product	Volume	50 cartridges/box
<b>AFFINIMIP® SPE PAHs</b>	3mL	FS119-03
<b>AFFINIMIP® SPE Phenolics</b>	3mL	FS103-03
<b>AttractSPE® HLB</b>	6mL	HLB-50.S.6.200
<b>SilactSPE™ CN/SiOH</b>	3mL	CNSiOH-50.S.3.500.1g
	6mL	CNSiOH-50.S.6.500.1g
	6mL glass	CNSiOH-50.G.6.500.1g

For more information or ordering: [contact@affinisep.com](mailto:contact@affinisep.com)

Website: [www.affinisep.com](http://www.affinisep.com)