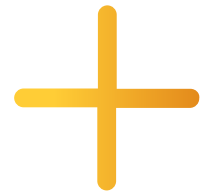


Application Note



**Determination of PAHs in Olive and Rapeseed oils
by LC-FLD using AFFINIMIP®SPE PAHs**



INTRODUCTION :

Polycyclic Aromatic Hydrocarbons (PAHs) are a large group of organic compounds with two or more fused aromatic rings and are known to be carcinogenic. Human beings are exposed to PAHs mostly by intake of food. As these are highly soluble in lipophilic matrices, edible oils can be an important source of contamination by PAHs. In 2011, EU Commission Regulation No 835/2011, amending Regulation 1881/2006, set maximum levels in edible oils to 2 µg/Kg of benzo[a]pyrene individually, and 10 µg/Kg of benzo[a]pyrene, benzo[b]fluoranthene, chrysene and benzo[a]anthracene combined.

This application note describes the extraction and LC-FLD analysis of 7 PAHs (including the four regulated ones) in olive oil and rapeseed (canola) oil using **AFFINIMIP®SPE PAHs 3mL**.

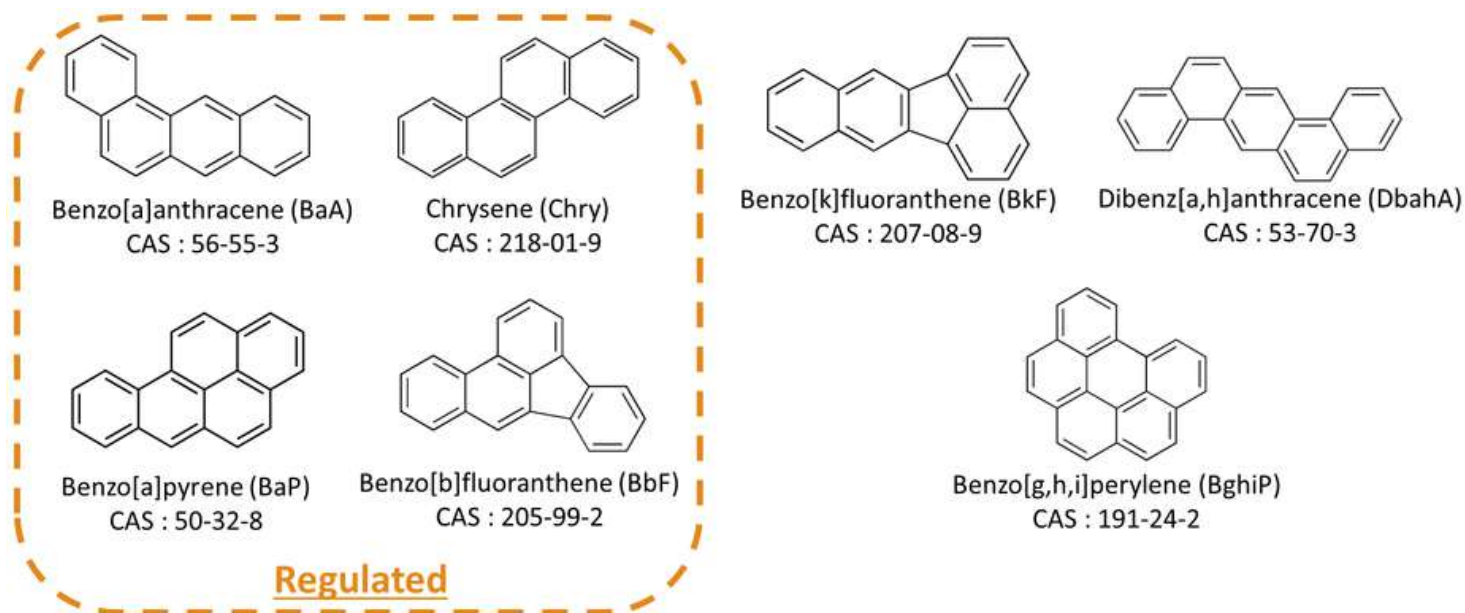


Figure 1. List of the tested PAHs

Sample preparation

In this application note, canola oil and olive oil were both spiked with 7 PAHs and then purified by SPE using **AFFINIMIP®SPE PAHs 3 mL**. Each spiked oil was tested two times. A blank (non-spiked) was also tested to determine the potential presence of PAHs in oils.

Préparation of the loading solution:

10 mL of oil is spiked at 2µg/Kg with a mix of 7 PAHs, then 10 mL of cyclohexane is added. The mixture is stirred to form the loading solution.

Extraction and analysis

CONDITIONING

- 3mL cyclohexane

LOADING

- 2 mL loading solution (~0.3mL/min)

WASHING

- 1mL cyclohexane

ELUTION

- 3mL Ethyl Acetate

The elution solutions were evaporated to dryness under vacuum at 40°C for 20 minutes, then dissolved in 1mL of acetonitrile prior to analysis.



The analyses were carried out by LC-FLD.

COMPOUNDS	CANOLA OIL			OLIVE OIL		
	BLANK µg/Kg	% RECOVERY CANOLA 1	% RECOVERY CANOLA2	BLANK µg/Kg	% RECOVERY OLIVE 1	% RECOVERY OLIVE 2
Benzo[a]anthracene	0.58	97%	89%	1.22	86%	87%
Chrysene	N.D	98%	92%	1.02	88%	92%
Benzo[a]pyrene	N.D	102%	92%	N.D	92%	98%
Benzo[b]fluoranthene	1.08	112%	105%	1.46	121%	109%
Benzo[k]fluoranthene	N.D	93%	93%	N.D	101%	103%
Dibenz[a,h]anthracene	N.D	95%	94%	N.D	103%	115%
Benzo[g,h,i]perylene	N.D	87%	94%	N.D	111%	109%

Table 1. Concentration found in blank (non-spiked oils) and duplicate recovery yields (blank subtracted) for rapeseed (canola) oil and olive oil obtained using **AFFINIMIP®SPE PAHs 3mL**. (N.D = Not Detected).

CONCLUSION

AFFINIMIP®SPE PAHs cartridges have shown excellent performances for the extraction and analysis of 7 PAHs in canola and olive oils. Excellent recovery yields were obtained between 86% and 121%. Moreover, the SPE purification is suitable for GC-MS/MS (see application note AN-0014-01) as it reduces the risk of premature GC-MS/MS fouling.

Product references :

AFFINIMIP®SPE PAHs cartridges :

- **FS119-03-NG for AFFINIMIP®SPE PAHs - 3mL - 50/pk**
- **FS119-03B-NG for AFFINIMIP®SPE PAHs - 6mL - 50/pk**