

## SupelMIP™ SPE – PAHs

### Product Description:

Molecularly imprinted polymers (MIPs) are a class of highly cross-linked polymer-based molecular recognition elements engineered to bind one target compound or a class of structurally related target compounds with high selectivity. Selectivity is introduced during MIP synthesis in which a template molecule, designed to mimic the analyte, guide the formation of specific cavities or imprints that are sterically and chemically complementary to the target analyte(s). **It is therefore critical for analysts to use the methodology described below when using this phase.** Conventional generic methodologies employed with conventional SPE chemistries (e.g., normal-phase silica) will yield sub-optimal results when employed with this phase.

The following method(s) have been determined for **polyaromatic hydrocarbons (PAHs)** that can be optimized for a number of matrices. The PAHs that have been tested include: **chrysene, benzo[a]anthracene, benzo[k]fluoranthene, benzo[b]fluoranthene, benzo(a)pyrene, indeno[1,2,3-cd]pyrene, dibenzo[α,h]anthracene and benzo[ghi]perylene.** The SupelMIP SPE – PAHs is not suitable for extracting smaller PAH compounds (2-3 rings); and for quantitative extraction of pyrene.

The first procedure is a general procedure that can be followed if a matrix specific method is not included in this data/instruction sheet. This general procedure represents a recommended starting point for further optimization. The general procedure is followed by matrix specific procedures.

For the most recent matrix specific applications, please visit [www.sigma-aldrich.com/supelmip](http://www.sigma-aldrich.com/supelmip) and download the most recent version of the data/instruction sheet.

**Important Note:** The below procedure(s) may require further optimization. A special team of experts in SupelMIP SPE method develop has been formed to offer technical consultation. To reach a SupelMIP technical expert, please visit [www.sigma-aldrich.com/supelmip-techsupport](http://www.sigma-aldrich.com/supelmip-techsupport) and fill out the questionnaire. A SupelMIP scientist will respond within 24 hours (barring holidays).

### Protocol for Extraction of PAHs – General Procedure:

#### Sample Pre-treatment

##### For solid/tissue samples:

- Extract PAHs into hexane or cyclohexane using 0.5-1 g of sample

##### For liquid samples:

- For oil/fat samples dilute 1:1 with cyclohexane
- For water-containing samples: extract into hexane or cyclohexane

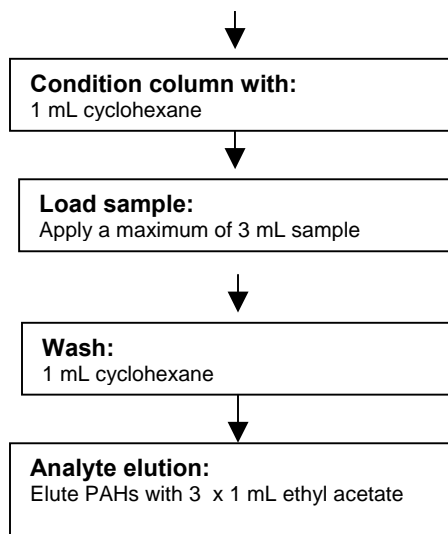
**Note:** *I.S. is recommended for accurate quantitation.*

*The use of toluene, ethyl acetate, methanol or diethyl ether is not recommended for load and wash solvents.*

*Recommended flow rate during sample load is  $\leq 1$  mL/min. If possible use gravity flow during the sample load step.*

*A flow rate of 0.5-1 mL/min. is recommended for each wash step.*

*Recommended flow rate during elution is  $\sim 0.5$  mL/min*



*2-3 mL cyclohexane may be used if cleaner extracts are needed*

*Apply a gentle vacuum (-0.4 bar or -12 in Hg for 5-10 s) between each wash step unless noted otherwise.*

Evaporate the elution solvent to dryness and reconstitute in ethyl acetate:hexane (1:1) for GC analysis or in the mobile phase for LC analysis

**Note:** *PAHs lighter than chrysene can be lost during evaporation*

## Protocol for Extraction of PAHs in Edible Oil (e.g., Olive Oil, Corn Oil, Peanut Oil):

### Sample Pre-treatment

1. Record the weight of the oil sample or aliquot 1 mL of the oil sample if the density of the oil sample is known
2. Dilute oil sample with cyclohexane (1:1 V/V)

**Note:** I.S. is recommended for each analyte for accurate quantitation.

**Condition column with:**  
1 mL cyclohexane

**Load sample:**  
Apply a maximum of 3 mL sample

**Wash #1:**  
1 mL cyclohexane

**Analyte elution:**  
Elute PAHs with 3 x 1 mL ethyl acetate

Recommended flow rate during sample load is  $\leq 1$  mL/min. If possible use gravity flow during the sample load step.

A flow rate of 0.5-1 mL/min. is recommended for wash step.

Recommended flow rate during elution is  $\sim 0.5$  mL/min

Apply a gentle vacuum (-0.4 bar or -12 in Hg for 5-10 s) between each wash step unless noted otherwise.

Evaporate the elution solvent to dryness at 45 °C and reconstitute in 0.2 mL of cyclohexane-ethylacetate (1:1 V/V).

### Troubleshooting:

#### Improve Recovery:

- ◆ Do not use toluene, ethyl acetate, methanol during sample load and wash steps

### Recommended Analytical Method:

<p><b>Recommended Analytical Technique:</b></p> <p><b>GC-MS</b></p>	<p>column: SLB™-5ms, 30 m x 0.25 mm I.D. x 0.25 µm (Cat. No. 28471-U)</p> <p>instrument: Agilent® GC-MS</p> <p>flow rate: helium, 2 mL/min, constant</p> <p>injector temp: 300 °C</p> <p>oven: 60 °C, 25 °C/min. to 275 °C ( 5 min.), 10 °C/min. to 300 °C (1 min.)</p> <p>injection: 1 µL, splitless</p> <p>MS detection: autotune + EM offset of 300</p> <p>scan range: SIM</p>
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**Product Information:**

Description	Pkg. Qty.	Cat. No.
<b>SupelMIP SPE – PAHs</b>		
50mg/3 mL	50	52773-U
<b>SupelMIP SPE - NSAIDs</b>		
25 mg/3 mL	50	52769-U
<b>SupelMIP SPE - Nitroimidazoles</b>		
50 mg/3 mL	50	52734-U
<b>SupelMIP SPE - Full Beta-receptors (beta-blockers &amp; beta-agonists)</b>		
25 mg/10 mL (LRC)	50	53223-U
25 mg/3 mL	50	53224-U
<b>SupelMIP SPE - Beta-blocker (class selective)</b>		
25 mg/10 mL (LRC)	50	53218-U
25 mg/3 mL	50	53213-U
<b>SupelMIP SPE - Beta-agonists (class selective)</b>		
25 mg/10 mL (LRC)	50	53202-U
25 mg/3 mL	50	53225-U
<b>SupelMIP SPE - Clenbuterol</b>		
25 mg/10 mL (LRC)	50	53201-U
<b>SupelMIP SPE - TSNAs (NNK, NNN, NAB, NAT)</b>		
50 mg/10 mL (LRC)	50	53221-U
50 mg/3 mL	50	53222-U
<b>SupelMIP SPE – NNAL</b>		
25 mg/10 mL (LRC)	50	53206-U
25 mg/3 mL	50	53203-U
<b>SupelMIP SPE - Chloramphenicol</b>		
25 mg/10 mL (LRC)	50	53210-U
25 mg/3 mL	50	53209-U
<b>SupelMIP SPE – Fluoroquinolones</b>		
25 mg/3 mL	50	53269-U
<b>SupelMIP SPE – Amphetamines (class selective)</b>		
25 mg/3 mL	50	53228-U
<b>SupelMIP SPE - Riboflavin (Vitamin B2)</b>		
25 mg/10 mL (LRC)	50	53207-U
<b>SupelMIP SPE - Triazine 10</b>		
25 mg/10 mL (LRC)	50	53208-U

SupelMIP SPE developed by MIP Technologies AB  
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