

# **A rapid method for the determination of 4 PAHs in oil by UHPLC-SPE on line**

Mickaël Watiez<sup>1</sup>, Mélanie Marteau<sup>1</sup>, Alban Huteau<sup>2</sup>, Mikaël Levi<sup>2</sup>, Sylvie Breton<sup>1</sup>, Alain Huertas<sup>1</sup>

<sup>1</sup>Lesieur, France

<sup>2</sup> Shimadzu, France

Polycyclic Aromatic Hydrocarbons (PAHs) are one of the most common contaminant in crude oil because of their lipophilic properties. PAHs are eliminated during bleaching step with activated charcoal during oil refining. Determination of the four PAHs referred to the future UE regulation, benzo(a)pyrene, benz(a)anthracene, benzo(b)fluoranthene and chrysene is performed in crude oil in order to determine the right amount of activated charcoal added to the refined oil to fulfill the UE regulation.

Nowadays, quantification of the PAHs is performed by HPLC with fluorescence detection after an extraction with silica gel or SPE (Solid Phase Extraction) cartridges. We developed a new method using an UHPLC (Ultra High Pressure Liquid Chromatography)–SPE on line system coupled to a fluorescence detector. After injection of the oil sample, the SPE cartridge is purified by isopropanol, then PAHs are eluted by a more hydrophilic solvent. PAHs are quantified by external calibration.

Our statistic study shows that the new method and the actual method were equivalent. The chromatographic conditions give us a good resolution ( $R_s > 1,5$ ) between BaP and other PAHs in a run time of 10 minutes including extraction, separation and quantification. Our limit of quantification is about 0,5 ppb for each PAHs. About 500 raw oil injections were performed on the same SPE column, which give us an interesting economic gain compared to offline SPE. In addition, we obtain a better reactivity due to the short time of analysis.