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Liquid-liquid extraction-programmed temperature vaporizer-gas chromatography-mass spectrometry for the determination of polycyclic aromatic hydrocarbons in saliva samples. Application to the occupational exposure of firefighters.

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Abstract

We present the development and validation of a sensitive method for the reliable determination of sixteen polycyclic aromatic hydrocarbons (PAHs) in saliva samples, which can be used as exposure markers. This method was based on a liquid-liquid extraction and programmed temperature vaporizer-gas chromatography-mass spectrometry analysis (LLE-PTV-GC-MS). Since no matrix effect was found, quantification was performed using external calibration. The detection limits were lower than or equal to $0.057 \mu\text{g L}^{-1}$ for all analytes, and repeatability and reproducibility (relative standard deviation, RSD) were always lower than or equal to 11 and 19 %, respectively. The method was used to quantify polycyclic aromatic hydrocarbons in the saliva samples taken from firefighters and unexposed volunteers, detecting the presence of seven of the sixteen analytes analysed. Two of the compounds (fluorene and phenanthrene) were found in the both exposed and unexposed individuals, while the remaining five analytes (naphthalene, acenaphthylene, anthracene, fluoranthene and

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