XXII Encontro Luso-Galego

Química

9 a 11 novembro 2016

Instituto Politécnico de Bragança | BRAGANÇA - PORTUGAL

Livro de Resumos

http://xxiilgq.eventos.chemistry.pt

Sociedade Portuguesa de Química

Colegio Oficial de Químicos de Galicia

XXII Encontro Luso-Galego

Química

9 a 11 novembro 2016

Instituto Politécnico de Bragança
BRAGANÇA – PORTUGAL

Sociedade Portuguesa de Química

ipb Instituto Politécnico de Bragança

Colegio Oficial de Químicos de Galicia

TÍTULO
Livro de Resumos do XXII Encontro Luso-Galego de Química

EDITORES
Helder T. Gomes, Maria Olga A. S. Ferreira, João Barreira, Joana Amaral

EDIÇÃO
Sociedade Portuguesa de Química
Av. da República, 45 – 3º Esq
1050-187 Lisboa – Portugal

DATA
Novembro de 2016

EXECUÇÃO GRÁFICA
IPB, Soraia Maduro (design)
Sersilito – Maia (impressão)

FOTO DE CAPA
Rami Arafah

CATALOGAÇÃO RECOMENDADA
Livro de Resumos do XXII Encontro Luso-Galego de Química
Instituto Politécnico de Bragança, Bragança, Portugal, 2016, 336 páginas

ISBN
978-989-8124-17-3

TIRAGEM
350 exemplares

Urinary levels of monohydroxyl PAH metabolites in Portuguese firefighters: background levels and impact of tobacco smoke

M. Oliveira[1,2], K. Slezakova[1,2], M. J. Gomes[3], A. Azevedo[3], J. P. Teixeira[4,5], C. Delerue-Matos[1], M. C. Pereira[2], S. Morais[1,*]

[1]REQUIMTE-LAQV, Instituto Superior de Engenharia, Instituto Politécnico do Porto, R. Dr. António Bernardino de Almeida 431, Porto, Portugal

[2]LEPABE, Departamento de Engenharia Química, Faculdade de Engenharia, Universidade do Porto, R. Dr. Roberto Frias, Porto, Portugal

[3]Escola Superior de Saúde, Instituto Politécnico de Bragança, Av. D. Afonso V, Bragança, Portugal.

[4]Instituto Nacional de Saúde Pública, Departamento de Saúde Ambiental, R. Alexandre Herculano 321, Porto, Portugal

[5]Instituto de Saúde Pública, Universidade do Porto, R. das Taipas 135, Porto, Portugal

**sbm@isep.ipp.pt*

Firefighting occupational exposure is classified as possible carcinogen to humans by the International Agency for Research on Cancer and the US National Institute for Occupational Safety and Health [1,2]. Full monitoring of firefighters' exposure to PAHs via all exposure routes should be performed through the quantification of their internal dose. The consumption of tobacco is responsible for the exposure to many smoke components including more than sixty known carcinogens, including polycyclic aromatic hydrocarbons (PAHs) [3]. PAHs are ubiquitous compounds formed during pyrolysis or incomplete combustion of organic matter, being well known for their toxic, mutagenic, and carcinogenic properties to humans [4,5]. So far, the impact of tobacco smoke on firefighters' total exposure to PAHs is very limited.

The present work assesses the background total PAHs internal dose of healthy smoking and non-smoking firefighters serving at Bragança (North of Portugal) fire station. Five of the most predominant PAH metabolites, namely 1-hydroxynaphthalene (1OHNaph), 1-hydroxyacenaphthene (1OHAce), 2-hydroxyfluorene (2OHFlu), 1-hydroxyphenanthrene (1OHPhen), and 1-hydroxypyrene (1OHPy) were detected in all firefighters. Urinary 3-hydroxybenzo[a]pyrene, the PAH biomarker of carcinogenicity, was not detected. Globally, total urinary concentrations (∑OH-PAHs) ranged between 0.491 to 1.02 μmol/mol creatinine and from 0.053 to 0.472 μmol/mol creatinine, respectively for smoking and no-smoking firefighters. The urinary levels of OH-PAHs were 1.3 (2OHFlu) to 2.7 (1OHPy) times higher in smoking than in no-smoking firefighters. Urinary 1OHNaph and 1OHAce were by far the most abundant compounds (>90% of ∑OH-PAHs), being followed by 2OHFlu (2.7-5.4%), 1OHPy (2.1-4.1%), and 1OHPhen (2.2%). Urinary OH-PAH levels will be discussed taking in consideration the existent preliminary guidelines for occupational exposure to PAHs.

Acknowledgments

Authors are thankful to all firefighters involved in the study. This work was supported by European Union (FEDER funds through COMPETE) and National Funds (Fundação para a Ciência e Tecnologia, FCT) through projects UID/QUI/50006/2013, POCI-01-0145-FEDER-007265 and POCI-01-0145-FEDER-006939, by the FCT/MEC with national funds and co-funded by FEDER in the scope of the P2020 Partnership Agreement. Additional financial support was provided by FCT through the fellowship SFRH/BPD/105100/2014.

Referências

[1] IARC Monographs on the Evaluation of Carcinogenic Risks to Humans. International Agency for Research on Cancer, 98 (2010) 405-569.
[2] U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention. National Institute for Occupational Safety and Health, DHHS (NIOSH) 2005-149 (2007) 1-383.
[3] IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans, 38 (1986) 1-432.
[4] IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, International Agency for Research on Cancer, 92 (2010) 1-853.
[5] IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, International Agency for Research on Cancer 82, (2002) 1-556.