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Eco-friendly UHPLC-MS/MS method for analysis of multi-class micropollutants in drinking water

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Organic micropollutants are continuously introduced into the environment, being not completely removed during wastewater treatment and found at trace concentrations (ng/Lµg/L) in receiving water bodies, which might be sources for drinking water (DW) supply, bringing possible consequences for public health [1]. In the particular case of the European Union (EU), some regulations on water pollution have been published in the last years, namely Directive 39/2013/EU [2] identifying 45 priority substances (PSs) to meet the protection of the aquatic compartments and the human health. More recently, a Watch List of contaminants of emerging concern (CECs) for EU monitoring in surface water bodies was defined in the Decision 2015/495/EU [3]. An eco-friendly analytical method based on offline solid phase extraction followed by ultra-high-performance liquid chromatography coupled to tandem mass spectrometry (SPE-UHPLC-MS/MS) was developed for the simultaneous determination of 21 pollutants in DW: 7 pesticides, 1 industrial compound, 12 pharmaceuticals and 1 metabolite, some of them defined as PSs in the Directive 2013/39/EU or CECs included in the recent Watch List of Decision 2015/495/EU. A widespread occurrence was verified at ng/L levels in DW samples from different sources (tap, wells and fountains) and locations of North of Portugal, but the estimated hazard quotients suggested no adverse effects to humans.

Biography

Ana Rita Ribeiro has a strong expertise in analytical chemistry and environmental monitoring and policy, and relevant skills in the field of water treatment by advanced processes. She initiated a new research line at Laboratory of Separation and Reaction Engineering - Laboratory of Catalysis and Materials (LSRE-LCM), Faculdade de Engenharia da Universidade do Porto, implementing analytical methodologies to determine organic pollutants at residual concentrations in environmental samples using UHPLC-MS/MS to identify transformation products. She is author/co-author of 30 original publications, including peer-reviewed scientific journals and books, as well as the 45 oral and poster communications in both national and international conferences.

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