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Validation of a green chromatographic method for the analysis of β blockers that uses a surfactant aqueous solution as mobile phase

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The addition of a surfactant to an aqueous mobile phase at micelle forming concentrations in reversed-phase liquid chromatography (RPLC) is the basis of the chromatographic mode named micellar liquid chromatography (MLC). The anionic surfactant sodium dodecyl sulphate (SDS) is selected in most reports. SDS enhances remarkably the efficiency and peak symmetry of basic compounds by covering the residual silanols in the stationary phase, which remains negatively charged. However, this increases significantly the retention of cationic basic compounds, forcing the addition of a certain amount of organic solvent. On the other hand, the use of a non-ionic surfactant such as Brij-35 increases the polarity of the stationary phase and allows the elution of compounds of low or intermediate polarity without the need of organic solvent. However, polar compounds are not retained. The use of micellar mobile phases containing mixtures of both surfactants (SDS and Brij-35) can modulate the favourable features of each micellar system, yielding successful resolution and practical analysis times for moderately polar basic compounds, such as many β -blockers, also without the addition of organic solvent. In this work, a procedure which employs mixed mobile phases of SDS and Brij 35 is applied to the analysis of a group of β -blockers in urine samples. The procedure is validated following the Food and Drug Administration guidelines in terms of limit of detection, sensitivity, linearity, precision, accuracy, recovery and robustness. The use of the mixed micellar mobile phase has the advantage of the direct injection of the urine sample, which expedites the routine analysis.

Biography

María José Ruiz-Ángel obtained her PhD from the University of Valencia (Spain) in 2003. In 2004–2006, she was granted with a Post-doctorate fellowship in the Laboratoire des Sciences Analytiques at the University Claude Bernard in Lyon (France). In 2007, she was awarded with a Ramón y Cajal research position in the Department of Analytical Chemistry at the University of Valencia, where she is Professor since March 2012. She has written over 50 research articles, most focusing on secondary equilibria using surfactants and ionic liquids, fundamental studies in HPLC and development of analytical methods for pharmaceutical and clinical samples.

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