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Comparison of gradients of organic solvent in micellar liquid chromatography using the surfactants sodium dodecyl sulphate and Brij-35

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Micellar liquid chromatography (MLC) is a reversed-phase liquid chromatographic (RPLC) mode, where the mobile phase contains an aqueous solution of a surfactant above its critical micellar concentration. Since solutions containing only surfactant are weak and yield poor peak shape, most applications using MLC involve mobile phases containing a small amount organic solvent. As long as its concentration is low enough, the formation of micelles is favored, but if this concentration is sufficiently increased, micelles breakdown and a submicellar environment is achieved. This chromatographic mode, named high submicellar liquid chromatography (HSLC), reduces the analysis time and improves the peak shape with respect to MLC and conventional RPLC. However, it is not possible to perform the direct injection of physiological samples assisted by the interaction with the micelles in the mobile phase. In this work, we report the implementation of a gradient elution mode that combines the advantages of both micellar modes. The use of a micellar eluent in the initial step allows the direct injection of the physiological sample, and once the proteins are swept away, the elution strength is increased using an organic solvent gradient, which allows the elution of moderately or low polar compounds. Sodium dodecyl sulphate (SDS) has been the preferred surfactant to design gradient procedures in MLC, whereas the non-ionic Brij-35 is interesting for the analysis of low polar compounds, since it increases the polarity of the stationary phase. The potential of gradient elution in MLC/HSLC using Brij-35 and SDS is compared.

Biography

Ester Peris-García obtained the Chemistry degree (2013) at the University Jaume I (Castellón) and the Master degree in Experimental Techniques in Chemistry at the University of Valencia (2014). She is now performing diverse research activities in the Department of Analytical Chemistry to complete her PhD. During her Master studies, she began her collaboration with the FUSCHROM group in the field of micellar liquid chromatography applied to the analysis of basic compounds of pharmaceutical interest. She has been awarded with grants for young researchers and has worked in the industries IPROMA, CEAM and Torrecid in Castellón.

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