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Analytica-2015: Comparison of gradients of organic solvent in micellar liquid chromatography using the surfactants sodium dodecyl sulphate and Brij-35 - Ester Peris-García - University of Valencia

Ester Peris-García
University of Valencia, Spain

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.

Micellar liquid chromatography (MLC) is a productive option in contrast to customary turned around stage fluid chromatography with hydro-natural versatile stages. Very nearly three many years of experience have brought about an expanding creation of scientific applications. Ebb and flow worry about nature likewise uncovers MLC as an intriguing method for "green" science since it utilizes portable stages containing 90% or more water. These micellar portable stages have a low harmfulness and are not creating perilous squanders. The fixed stage is adjusted with an around consistent measure of surfactant monomers, and the solubilising ability of the portable stage is modified by the nearness of micelles, offering ascend to an extraordinary assortment of cooperations (hydrophobic, ionic, and steric) with significant ramifications in maintenance and selectivity. From its beginnings in 1980, the strategy has developed up to turning out to be in a genuine option in certain examples (and a supplement in others) to old style RPLC with watery natural blends, inferable from its impossible to miss highlights and one of a kind points of interest. The expansion of a natural dissolvable to the portable stage was, in any case, before long recommended so as to upgrade the low efficiencies and feeble elution quality related with the versatile stages that contained just micelles.

Micellar liquid chromatography (MLC), which utilizes versatile stages containing a surfactant over its critical micelle concentration (CMC), is an option in contrast to ordinary turned around stage fluid chromatography and gives an answer for the immediate infusion of physiological or food tests by solubilising proteins (that are eluted together or not long after the dissolvable front). The chance of legitimately infusing tests into the chromatograph rearranges and speeds up treatment, which presents expository methods more noteworthy precision and a lower cost. The adaptability of MLC is because of the wide assortment of associations that are set up among the eluted solutes, the fixed stage, the fluid stage and micelles. Their eluent attributes permit the investigation of mixes with a wide scope of polarities.

The nearness of a surfactant not just adjusts the cooperations set up inside the segment yet additionally diminishes the important measure of natural dissolvable in the versatile stage, which can be reused because of low dissipation. These attributes are really intriguing given current worries about decreasing natural contaminant buildups in labs.

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.

Email: al117325@alumail.uji.es

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