

## Nanostructured liquids based on decanoic acid reverse micelles for the microextraction of quinolone antibiotic residues from aquaculture fishes and seafood.

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Nanostructured liquids based on decanoic acid reverse micelles have emerged in the last few years as a valuable alternative for the extraction of organic compounds prior to their chromatographic determination<sup>1</sup>. The most noticeable characteristics of these nanostructured liquids include: capability to solubilise compounds through different interaction mechanisms, high number of solubilisation sites, low cost and experimental convenience.

This article deals with the evaluation of nanostructured liquids based on decanoic acid reverse micelles for the extraction of oxolinic acid (OXO) and flumequine (FLU) from aquaculture products. Residues of these acidic quinolone antibiotics (AQAs) are frequently found in farming fishes and seafood because of their wide use as effective and low-costly antimicrobial agents. The current maximum residue levels (MRLs) of OXO and FLU permitted by the European Union in edible animal tissues are 100  $\mu\text{g Kg}^{-1}$  and 600  $\mu\text{g Kg}^{-1}$ , respectively. Reported methods for the determination of AQAs in edible animal tissues usually involve laborious and time-consuming sample treatments including extractions in organic solvents and one or more clean-up steps.

The nanostructured liquid used for extractions in this work was synthesized by dissolving DeA in THF and adding water as coacervating agent (95% v/v). DeA form reverse micelles in THF, which grow in the presence of water owing to their partial desolvation. The larger aggregates formed are insoluble in the water:THF solution and separate from it as an immiscible liquid (the nanostructured liquid). The procedure used for the extraction of AQAs from aquaculture products was as follows: 400  $\mu\text{L}$  of the nanostructured liquid synthesized were added to about 200 mg of chopped sample. Then, the mixture was vortex-shaken and centrifuged. Analytes were determined in the nanostructured extract by liquid chromatography/fluorescence detection.

The proposed nanostructured liquid-based microextraction approach surpasses to those using organic solvent in: 1) Efficiency; recoveries achieved are quantitative and independent on the composition of sample matrices. They ranged between 99-102% with relative standard deviations in the interval 0.2-5% for salmon, sea trout, sea bass, gilt-head bream and prawn samples fortified at analyte concentrations equal and below the corresponding EU MRLs. 2) Simplicity; neither clean-up or solvent evaporation is required. 3) Rapidity; the sample treatment spend about 30 min. 4) environmental friendliness; the consumption of organic solvents is significantly reduced and their emission to the atmosphere avoided.

<sup>1</sup> Ruiz, F.J., Rubio S., Pérez-Bendito D., *Anal. Chem.*, **2007**, 79, 7473