

DEVELOPMENT AND VALIDATION OF HPLC/CAD METHOD FOR SIMULTANEOUS DETERMINATIONS OF ANIONIC, AMPHOTERIC AND CATIONIC SURFACTANTS MIXTURES

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Abstract

A simple, reliable and accurate HPLC/CAD (Corona Veo RS) method was developed for the determination of anionic (sodium dioctyl sulfosuccinate and sodium 1-dodecane sulfonate), amphoteric (CHAPS (3-[(3-Cholamidopropyl)dimethylammonio]-1-propanesulfonate hydrate)) and cationic (benzethonium chloride) surfactants mixture from synthetic samples. The chromatographic analysis was performed on an Acclaim Surfactant Plus (150 x 3.0 mm, 3 μ m d.p.) column from Thermo Scientific, kept at 30^oC. All experiments were performed in gradient elution conditions at a flow-rate of 0.6 ml/min. Mobile phase composition was a mixture of acetonitrile (A) and 0.1 M ammonium acetate solution acidified to pH 5 with acetic acid (B). The detection limits were 0.02 mg/l for anionic surfactants and 0.03 mg/l for cationic and amphoteric surfactants. The calibration curves were linear between 15 mg/l – 110 mg/l, with R² values above 0.992 for all surfactants. SPE using polymeric (Strata X) cartridges has been applied to extract and concentrate the target analytes from the synthetic samples. Surfactants recovery after SPE procedure was situated between 91.5 ÷ 94.6%. Intra-day and inter-day precision (RSD%) were situated between 4.0 ÷ 7.7% and 3.6 ÷ 8.7%, respectively. Quantitation limits (LOQs) were 0.06 mg/l for anionic surfactants and 0.09 mg/l for cationic and amphoteric surfactants. The new sensitive and selective HPLC/CAD developed method allows simultaneous determination of anionic, amphoteric and cationic surfactants mixture from environmental samples (surface water, wastewater).

Keywords: *HPLC/CAD, surface water, surfactant, waste water*