A METHOD FOR ESTIMATION OF FLUOROTENSIDES

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Fluorine containing tensides represent only a small portion of the total tenside production but because of their excellent tenside properties and their thermic and chemical stability they are used for many purposes[1]. Numerous representatives of this group are synthetized. Accumulation in water but also in sediment are to be expected due to the fairly high water solubility and the low biodegradability[2-4]. Little is known about their existence and effects in the environment not least because there were hardly any suitable uncomplicated analytical procedures up to now. The photometric procedures[5-6] for the groups of anionic, cationic and non-ionic tensides are not selective for fluorotensides as they also comprise non-fluorine tensides which are widely spread.
The HPLC-MS- procedure[7-8] developed in recent years is specific and it has a low detection limit, but it involves great expense.
Here we present a simple procedure for the determination of fluorotensides as summation parameter that does not respond to other tensides. Basically this procedure is suitable for water and also for sediment- and plant samples. In the case of water samples the following operations are performed: adsorption of the fluorotenside at charcoal, filtration through paper filter, drying, burning in an oxygen-flask at platinum contact according to SCHÖNIGER[9], absorption of the combustion gases in buffer solution, potentiometry of the released fluoride by means of fluoride-selective electrode. Sediment- and plant samples are burnt directly.
Five fluorotensides of various groups were taken for testing the procedure. The detection limits obtained for water samples correspond with the sensibility of the potentiometric determination of the released fluoride. Originally existing fluoride does not interfere.
In the case of sediment- and plant samples no reference material with a known content of fluorotenside was available to test the applicability of the procedure. For sediment, the problem was solved by adsorbing fluorotenside from water to sediment and by balancing the distribution between both compartments. It was found that the affinity of fluorotensides to sediment differs widely.
At present the detection limit for sediment depends on the fact that not much more than 100 mg of sampling material can be used.

The procedure was succesfully applied at fluorotenside samples taken from ecotoxicological experiments.

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