

Anionic Surfactant Test Kit

The Anionic Surfactant Test Kit promises to provide a new, sensitive and reliable field-based method for the analysis of anionic surfactants in water.

It is a safe alternative to the current MBAS (methylene blue active substances) technique that uses the suspected carcinogen chloroform in its extraction method.

The new kit detects the presence of an anionic surfactant in the field and indicates the concentration through a colour response strip. The field water sample is mixed with the solutions provided in the kit and if a blue band appears on the top immiscible layer of the sample then an anionic surfactant is present. The blue band is then compared to the colour strip providing an estimation of the concentration of the anionic surfactant.

The kit has broad application in the detection of aqueous film-forming foams (AFFF) based on anionic surfactants including light water and ansulite. AFFF users and groups responsible for related environmental monitoring will find this product rapid, safe and reliable.

Although at this stage the kit is designed for use with water samples, research is continuing on adapting the kit for soil testing.

The Anionic Surfactant Test Kit is protected under Australian Provisional Patent Application No. 2007905529.

Next steps

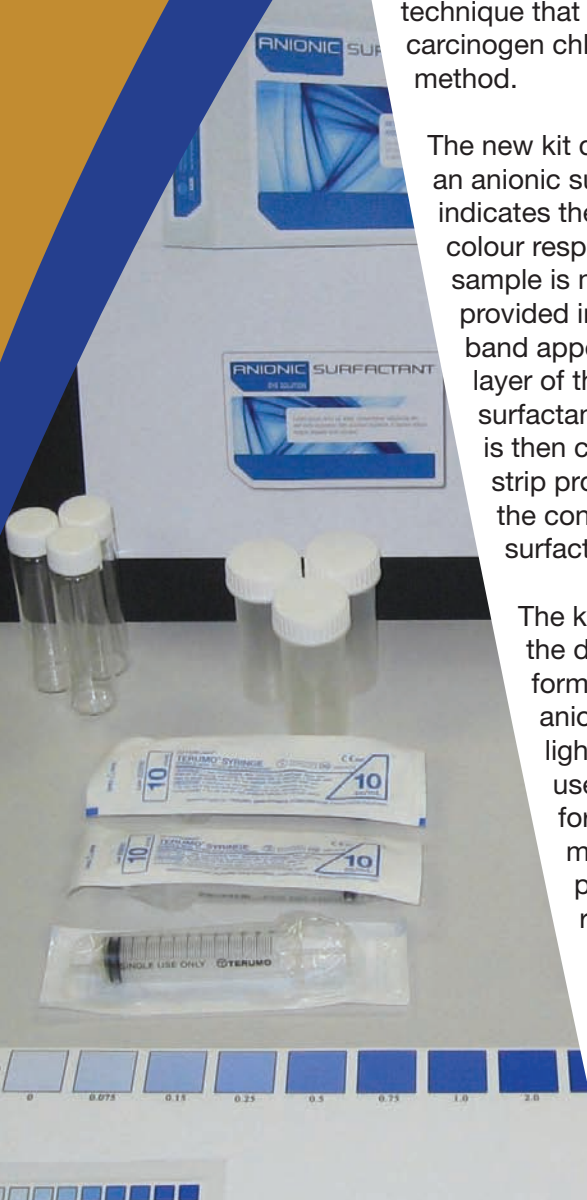
CRC CARE is about to commence extensive hands-on testing of the kit by people currently working in the field, which will provide feedback regarding its practicality, cost and extent of application. A full market assessment for the product is also underway.

Commercialisation interest

Positive results from the market assessment and the in-field testing will lead to full commercialisation.

Parties interested in the commercialisation of this kit should contact CRC CARE General Manager Maggie Dowling at:

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Detecting toxic residues from Aqueous Film Forming Foam (AFFF)

Technical background

Anionic surfactants are a group of specialty chemicals used in detergents. One particular class of surfactants, fluorinated surfactants, has unique properties that make them especially effective in fire-fighting applications.

Fluorinated surfactants used in fire-fighting applications are often referred to collectively as AFFF – aqueous film-forming foam. First developed in the 1960s by the US Naval Research Laboratory, various types of AFFF are effective against hydrocarbon fuel fires. They are now globally distributed, persistent and bio-accumulate.

Fluorinated surfactant compounds, such as PFOS and PFOA, are highly persistent both in humans and in the environment, more so even than DDT. They last in the soil for years and have serious health and ecological consequences. CRC CARE scientists have established that these chemicals are toxic to various soil organisms, such as worms, and that once in water can enter the food chain. It is suspected that these chemicals may be carcinogenic.

Although the fire-fighting foams which use PFOS (a content of about 1% in AFFF) are being gradually phased out and replaced with new fire-retardant chemicals, they are still in widespread use globally.

A safer alternative to MBAS assay

The methylene blue active substances (MBAS) assay is currently used to estimate the concentration of anionic surfactants (including AFFF) in water. It is a laboratory-based extraction where the anionic surfactant binds with a cationic dye. One of the key concerns of the MBAS assay is the use of chloroform, another suspected carcinogen, as the extraction solvent.

This new test kit avoids the use of chloroform for the detection of anionic surfactants. It is a safe alternative to the current MBAS assay and can be packaged into an easy-to-use field test kit to quickly estimate the anionic surfactant concentration in groundwater.

CRC CARE's field test kit determines the level of contamination at sites where PFOS and related compounds have been used, and as a preliminary screening tool will reduce sampling costs. As environmental agencies around the world come to grips with the extent of AFFF contamination, this safe new Australian test kit should attract substantial international interest.



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