DETERMINATION OF ANIONIC SURFACTANT IN SOME HOUSEHOLD DETERGENTS

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Abstract

Sodium lauryl sulfate is one of the anionic surfactants most widely used in the formulation of detergents and other household cleaning products. Anionic surfactants are useful because of their excellent cleansing, foaming and solubility properties. A major disadvantage is that they can be harsh and irritating to the skin. In absorption, metabolism and excretion studies, anionic surfactants had a degenerative effect on the cell membranes because of its protein denaturating properties. High levels of skin penetration may occur at even low concentration.

This project involves the determination of sodium lauryl sulfate in several household detergents using the classical titrimetric and spectrophotometric method. The titrimetric method involves the titration of the samples with benzethonium chloride solution. On the other hand, the spectrophotometric method involves the interaction of an ionic dye with the surfactants. It is based on the use of Azure A to form a complex with sodium lauryl sulfate, which is extracted from the aqueous phase to the chloroform phase. Colorimetric measurement of the Azure A in chloroform phase can be used for the determination of the sodium lauryl sulfate in the samples.

The results obtained from the two techniques showed that the spectrophotometric method gave a more reliable data due to its better repeatability. It was found that the floor detergent contained less than 1% of sodium lauryl sulfate, which is in accordance to the recommended safety level.

Abstrak

Natrium lauril sulfat ialah salah satu surfaktan anionik yang paling banyak digunakan di dalam rumus pembuatan detergen dan produk pembersihan rumah yang lain. Surfaktan anionik berguna kerana sifat pembersihan yang menakjubkan, senang menghasilkan buih dan keterlarutan yang baik. Satu keburukan yang utama adalah mereka boleh menjadi sangat buruk dan merangsang kepada kulit manusia. Pada kajian-kajian resapan, metabolisma dan perkumuhan, surfaktan anionik mempunyai kesan degeneratif pada membran sel kerana sifat penyahaslian protein. Natrium lauril sulfat akan masuk ke dalam kulit walaupun pada kepekatan yang sangat rendah.

Projek ini merangkumi penentuan natrium lauril sulfat di detergen yang biasa digunakan di rumah dengan menggunakan teknik titrimetrik yang melibatkan pentitratan sampel dengan larutan benzetonium klorida. Sementara, teknik spektrofotometrik melibatkan interaksi antara pencelup anionik dengan surfaktan. Ia adalah bergantung kepada penggunaan Azure A untuk membentuk suatu kompleks dengan natrium lauril sulfat, di mana ia adalah diekstrakkan dari lapisan akueus kepada lapisan kloroform. Pengukuran kolorimetrik oleh Azura A di dalam fasa kloroform boleh digunakan untuk penentuan natrium lauril sulfat di dalam sampel.

Keputusan yang didapati daripada dua teknik ini menunjukkan teknik spektrofotometrik memberikan suatu data yang lebih boleh dipercayai kerana keulangan yang lebih baik. Daripada keputusan, pembersih lantai mempunyai kandungan natrium

lauril sulfat yang kurang daripada 1%, iaitu memenuhi aras keselamatan yang dicadangkan.

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