

INTRODUCTION TO SURFACTANT ANALYSIS

Edited by D. C. Cullum



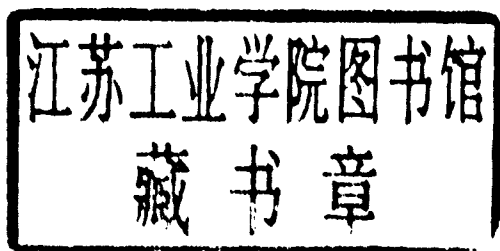
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Introduction to Surfactant Analysis

Edited by

D. C. CULLUM

Consultant specialising in Surfactant Analysis
Wirral



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Preface

As its title indicates, this book is intended mainly for the scientist who does not have a great deal of knowledge or experience of surfactant analysis. He or she may be a relatively experienced analyst in other fields, entering the surfactants industry for the first time, or someone who has worked with surfactants and now has to analyse them, or a recent graduate with little or no knowledge of either surfactants or analysis. It is this last group for whom the book is chiefly intended, though it is to be hoped that the others will find it worth reading and using. It is certainly primarily an introduction to the subject, but at the same time it includes a sufficiently broad range of methods to be used as a laboratory handbook.

It has been difficult to decide what to include and what to leave out, and not every reader will agree with my choice. For example, the determination of cloud point is omitted because, strictly speaking, it is not analysis. The reader seeking a method is well provided for by BS 6829: Section 4.1: 1988 or the identical ISO 1065:1991, which offer a choice of five. Colorimetric methods for trace amounts of surfactants are not included, because environmental analysis is a specialist area which I felt to be beyond the scope of an introductory text. The literature contains a large number of papers on the subject, and there are relevant chapters in a recent book [1]. The chapter on chromatography does deal with some of the more important trace components in products.

The book falls naturally into three parts. The first four chapters are largely about what to do, the next four about how to do it, and the last four, written by specialists in their respective fields, about the invaluable contribution that modern high-technology instruments can make. The centre of gravity of the book, however, is in classical or 'wet' chemistry, because most surfactant analysts work in small laboratories whose capital budgets are restricted. Most analytical laboratories nowadays have gas and/or liquid chromatographs and at least a modest infrared spectrometer—indeed they would find their task extremely difficult without them—but the cost of high-frequency NMR spectrometers and mass spectrometers cannot be justified except in large research organisations. The manufacturers of beakers and burettes will be in business for a good many years yet. In any case, the great value of high-tech instruments is not that they can do better what wet chemistry can already do, but that they can easily do things which are quite impossible by any other means.

Those interested in such matters will notice that I have used the term

'weight' throughout. There is a fashion for trying to abolish the word, saying mass even when you mean weight. This is just as foolish as saying weight when you mean mass. What a balance measures is weight, and that is what I have called it. I have also used the form '0.1 M' to denote concentrations of reagents, simply because it is the form most often used in practical chemistry, and it is more convenient than the form ' $c(\text{C}_{27}\text{H}_{42}\text{O}_2\text{NCl}) = 0.004 \text{ mol/l}$ '.

I hope the book will spark off an enthusiasm for the analytical chemistry of surfactants in at least some readers.

D.C.C.

1. Chapters by J. P. Hughes and J. Waters, in *Recent Developments in the Analysis of Surfactants* (ed. Porter, M. R.), Published for the Society for Chemical Industry, by Elsevier Applied Science, London, 1991.

Note: Chapters 9, 10 and 12 represent the views of the authors and are not necessarily the views of Unilever Research.

*To John Howard, schoolmaster,
who taught me that chemistry is fun*

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The International Organization for Standardization for permission to reproduce diagrams of the mechanical two-phase titration apparatus (Figure 3.2) from ISO 2271: 1989, the continuous liquid-liquid extractor (Figure 5.2) from ISO 6845: 1989 and the apparatus for iodometric determination of oxyethylene groups (Figure 6.1) from ISO 2270: 1989. The complete Standards can be obtained from the ISO member bodies or directly from the ISO Central Secretariat, Case Postale 56, 1211 Geneva 20, Switzerland.

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