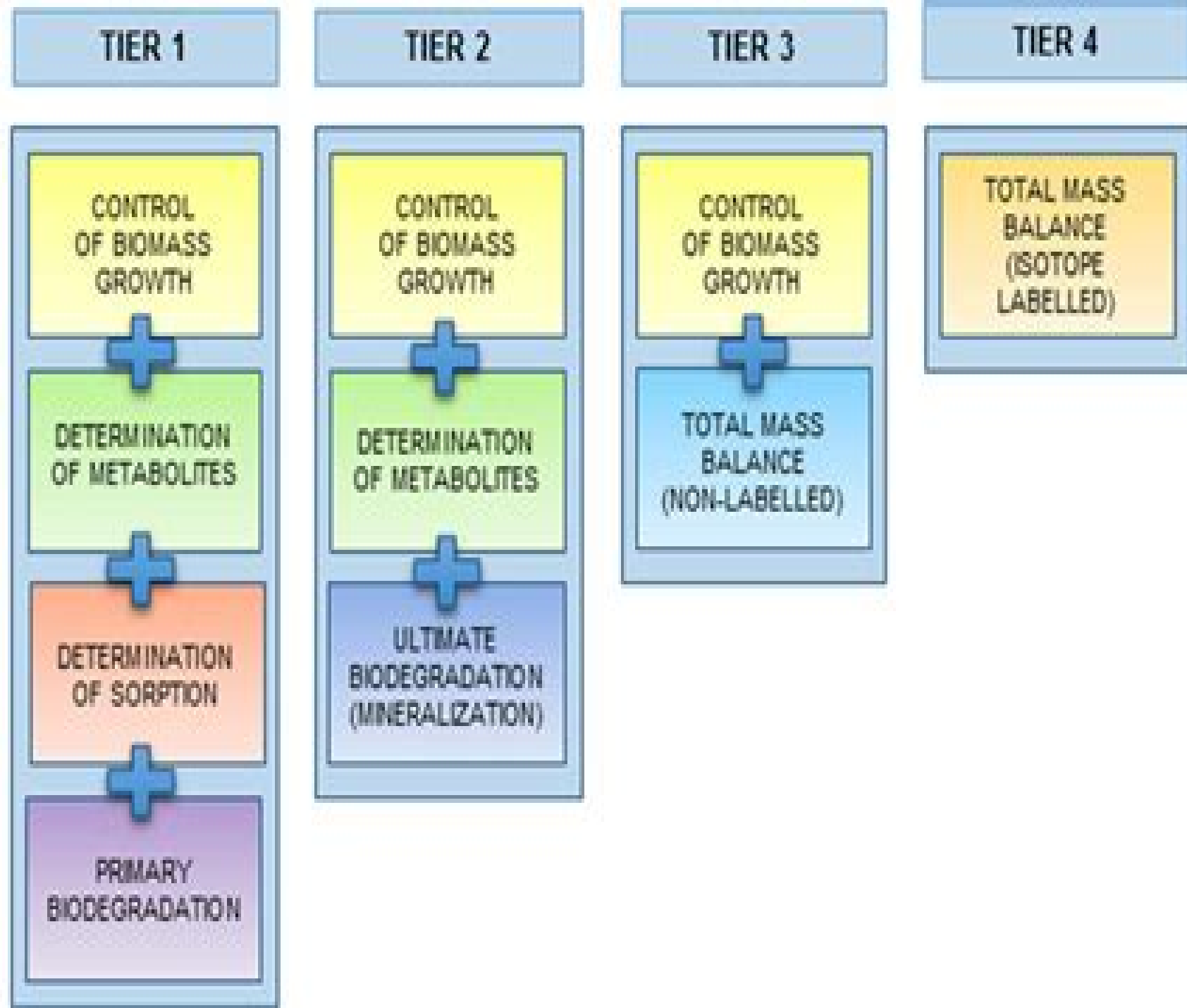


ACCURACY OF OBTAINED RESULTS



# Surfactant Biodegradation

**Girma Biresaw, Kash Mittal**



## **Surfactant Biodegradation:**

Surfactant Biodegradation, Second Edition, Robert Donald Swisher, 1986-10-31      **Biodegradability of Surfactants**  
D.R. Karsa, M.R. Porter, 2012-12-06 The awareness and development of biodegradable surfactants pre dates current pressures by the environmental movement by nearly three decades wherein a responsible industry mutually agreed to replace hard non biodegradable components of household detergents by soft biodegradable alternatives without course to legislation The only requirement at that time was for surfactants used in detergents to exhibit a primary biodegradability in excess of 80% this referring to the disappearance or removal from solution of the intact surface active material as detected by specified analytical techniques This proved useful as observed environmental impacts of surfactants e.g visible foam on rivers are associated with the intact molecule Test methods for primary biodegradability were eventually enshrined in EU legislation for nonionic surfactants Directive 82/1242 EEC amended 73/404/EEC and for anionic surfactants Directive 82/1243/EEC amended 73/405/EEC No approved test methods and resultant legislation have been developed for cationic and amphoteric surfactants to date The environmental classification of chemical substances which of course includes surfactants and associated risk assessment utilises a second criterion ready biodegradability This may be assessed by a number of methods which monitor oxygen uptake BOD carbon dioxide production or removal of dissolved organic carbon DOC Some surfactants which comply with the above Detergents Directive are borderline when it comes to ready biodegradability

**Surfactant Biodegradation** Robert Donald Swisher, 1970      **Preservation of Surfactant Formulations** F. Morpeth, 2012-12-06 Microbes are known to live in an enormous range of environments Their ability to survive and proliferate in diverse industrial systems is often a surprise to those not exposed to these problems in their work These systems contain a range of potential carbon sources one common theme being surfactants Surfactants are often not the components most prone to spoilage since some systems contain highly susceptible natural components such as starch and xanthan gum but the surfactant is a key part of the formulation and its extensive breakdown usually means that the material is beyond recovery The aim of this book is to describe in detail all aspects of the preservation of surfactant containing materials The book should be viewed as being in three discrete sections chapters 1-5 deal with and summarise essential background information chapters 6-11 discuss in detail various end use applications chapters 12-15 outline the regulatory and toxicology implication associated with the safe handling of preservatives Given the format of the book there is inevitably some duplication of information in the middle section with different authors describing essentially the same phenomena but on different substrates I hope the reader will find that although different chapters touch on the same topics the information around these areas is sufficiently different to justify their inclusion in this book and to be of interest It should also demonstrate what can be the most useful source of information the hard practical experience of the authors      **Novel Surfactants** Krister Holmberg, 2003-07-03 Extensively revised and expanded this timely reference discusses the synthesis

properties and potential applications of popular and emerging surfactant compounds and systems This reference reflects current research trends in green surfactants the production of surfactants using biotechnological methods and surfactants based on natural buildin

**Environmental and Human Safety of Major Surfactants** Sylvia S. Talmage,2020-04-08 The book summarizes and reviews the environmental and human safety of two classes of nonionic surfactants alcohol ethoxylates AE and alkylphenol ethoxylates APE This unique resource contains critical data from published sources as well as from unpublished studies submitted by Soap and Detergent Association member companies It reviews information on product chemistry and analysis biodegradation environmental levels including fate and distribution aquatic toxicity and human safety Recently developed analytical techniques for the extraction separation detection and measurement of nonionic surfactants and their metabolites in environmental samples are described Results of biodegradation studies performed with a variety of test systems are tabulated as are results of field studies at wastewater treatment plants Reported comparisons of environmental levels with results of acute and chronic aquatic toxicity tests are provided The information on the toxicity and irritation potential of AE and APE surfactants includes data from in vitro mammalian and human studies

**Handbook of Biodegradable Materials** Gomaa A. M. Ali,Abdel Salam H. Makhoulf,2023-02-20 This Handbook discusses the recent advances in biodegradation technologies and highlights emerging sustainable materials including environmentally friendly nano based materials for replacing plastics It is useful to scientists engineers biologists medical doctors and provides alternative eco friendly materials to replace the currently used ones with harmful impact on the environment and life The chapters present different types of alternative materials in diverse areas such as food packaging materials materials for construction and agricultural materials The principles and types of biodegradation technologies are described in depth

Anionic Surfactants Helmut W. Stache,1995-09-13 This work presents a comprehensive survey of important anionic surfactants It delineates current manufacturing technologies methods of analysis practical applications environmental behaviour and the physicochemical and toxicological properties of surfactants and their related by products The uses of anionic surfactants in the cleaning cosmetic textile leather food petroleum metalworking and paper industries are encompassed

**Fluorinated Surfactants and Repellents, Second Edition**, Erik Kissa,2001-02-09 A discussion of the synthesis problems theories and applications of fluorinated surfactants this second edition is updated with four new chapters on repellency and protection against soiling and staining and over 2900 references equations and drawings 800 more than the previous edition It lists alphabetically and explores numerous applications of fluorinated surfactants Called a most useful introduction to these fascinating materials by the Journal of Dispersion Science and Technology and a coherent and stimulating handbook the most useful book in the fluorinated surfactants field to date Recommended by the Journal of the Chemical Society Faraday Transactions this book is a source of factual data methods of manufacture and chemical structures for the surfactant scientist and user

Surfactants in Tribology Girma Biresaw,Kash Mittal,2013-03-20 The manufacture

and use of almost every consumer and industrial product rely on application of advanced knowledge in surface science and tribology. These two disciplines are of critical importance in major economic sectors such as mining, agriculture, manufacturing including metals, plastics, wood, computers, MEMS, NEMS, appliances, construction, transportation and medical instruments, transplants and diagnostic devices. An up to date reference with contributions by experts in surface science and tribology. *Surfactants in Tribology* Volume 3 discusses some of the underlying tribological and surface science issues relevant to many situations in diverse industries. The tradition of presenting new developments and research that began with the first volume in this groundbreaking series continues in the third volume. Comprising 19 chapters on various aspects of surfactants in tribology including subjects not covered in previous volumes, this book is presented in four parts: Nanotribology and Polymeric Systems; Biobased and Environmentally Friendly Lubricants and Additives; Tribological Properties of Aqueous and Nonaqueous Systems; and Advanced Tribological Concepts. Topics include tribological properties of nanoparticles, biopolymer friction, environmentally friendly surface active agents, biolubricants, aqueous mixed surfactant systems and surfactants in motor oil, drilling fluids and in electrowetting for MEMS and NEMS. The information in this volume provides a cutting edge reference connecting the fields of surfactants and tribology as a way forward to novel enhanced methods of controlling lubrication, friction and wear. Written by a global team of established authorities, this book reflects the latest developments highlighting the relevance of surfactants in tribological phenomena in a broad range of industries. It provides a valuable resource for readers working in or entering the fields of tribology and surface science. **Handbook of Property**

**Estimation Methods for Chemicals** Donald Mackay, Robert S. Boethling, 2000-03-29. A complete restructuring and updating of the classic 1982 *Handbook of Chemical Property Estimation Methods* commonly known as Lyman's *Handbook*, the *Handbook of Property Estimation Methods for Chemicals*. Environmental and Health Sciences reviews and recommends practical methods for estimating environmentally important properties of organic chemicals. *Biodegradation* Rolando

Chamy, 2013-06-14. This book contains a collection of different biodegradation research activities where biological processes take place. The book has two main sections: A Polymers and Surfactants Biodegradation and B Biodegradation Microbial Behaviour. **Encyclopedia of Surface and Colloid Science** - Arthur T. Hubbard, 2002-07-18. This comprehensive reference collects fundamental theories and recent research from a wide range of fields including biology, biochemistry, physics, applied mathematics and computer materials, surface and colloid science, providing key references, tools and analytical techniques for practical applications in industrial, agricultural and forensic processes as well as in the production of natural and synthetic compounds such as foods, minerals, paints, proteins, pharmaceuticals, polymers and soaps.

*Surfactant Science and Technology* Drew Myers, 2020-06-16. A solid introduction to the field of surfactant science, this new edition provides updated information about surfactant uses, structures and preparation as well as seven new chapters expanding on technology applications. Offers a comprehensive introduction and reference of the science and technology of

surface active materials Elaborates more fully than prior editions aspects of surfactant crystal structure as well as their effects on applications Adds more information on new classes and applications of natural surfactants in light of environmental consequences of surfactant use Chemistry and Technology of Surfactants Richard J. Farn, 2008-04-15

Surfactants are used throughout industry as components in a huge range of formulated products or as effect chemicals in the production or processing of other materials A detailed understanding of the basis of their activity is required by all those who use surfactants yet the new graduate or postgraduate chemist or chemical engineer will generally have little or no experience of how and why surfactants work Chemistry Technology of Surfactants is aimed at new graduate or postgraduate level chemists and chemical engineers at the beginning their industrial careers and those in later life who become involved with surfactants for the first time The book is a straightforward and practical survey of the chemistry of surfactants and their uses providing a basic introduction to surfactant theory information on the various types of surfactant and some application details This will allow readers to build on to their scientific education the concepts and principles on which the successful use of surfactants across a wide range of industries is based Encyclopedia of Surface and Colloid Science P. Somasundaran, 2006

Solution Behavior of Surfactants K.L. Mittal, E.J. Fendler, 2012-12-06 This and its companion Volume 2 comprise the proceedings of the International Symposium on Solution Behavior of Surfactants Theoretical and Applied Aspects organized under the auspices of the 11th Northeast Regional Meeting of the American Chemical Society held in Potsdam N Y June 30 July 3 1980 This Symposium represented the third event in the series of symposia dealing with the topic of surfactants in solution The first Symposium was held in Albany N Y in 1976 under the title Micellization Solubilization and Microemulsions 1 the proceedings of which have been documented in a two volume set The second was held under the title Solution Chemistry of Surfactants in 1978 in Knoxville TN and the proceedings of this event have also been properly chronicled A propos the fourth biennial Symposium in this series is entitled International Symposium on Surfactants in Solution K L Mittal and B Lindman Cochairmen and is scheduled to be held from June 27 to July 2 1982 in Lund Sweden Since these biennial events have been very successful and important in bringing researchers with varied interests together and in stimulating interdisciplinary communication so the plans are to continue these on a regular basis with a change in venue for each meeting

**Surfactant Biodegradation** R. D. Swisher, 1987 *Oilfield Chemistry and its Environmental Impact* Henry A. Craddock, 2018-05-11 Consolidates the many different chemistries being employed to provide environmentally acceptable products through the upstream oil and gas industry This book discusses the development and application of green chemistry in the oil and gas exploration and production industry over the last 25 years bringing together the various chemistries that are utilised for creating suitable environmental products Written by a highly respected consultant to the oil and gas industry it introduces readers to the principles and development of green chemistry in general and the regulatory framework specific to the oil and gas sector in the North Sea area and elsewhere in the world It also

explores economic drivers pertaining to the application of green chemistry in the sector Topics covered in Oilfield Chemistry and its Environmental Impact include polymer chemistry surfactants and amphiphiles phosphorus chemistry inorganic salts low molecular weight organics silicon chemistry and green solvents It also looks at sustainability in an extractive industry examining the approaches used and the other methodologies that could be applied in the development of better chemistries along with discussions about where the application of green chemistry is leading in this industry sector Provides the reader with a ready source of reference when considering what chemistries are appropriate for application to oilfield problems and looking for green chemistry solutions Brings together the pertinent regulations which workers in the field will find useful alongside the chemistries which meet the regulatory requirements Written by a well known specialist with a combined knowledge of chemistry manufacturing procedures and environmental issues Oilfield Chemistry and its Environmental Impact is an excellent book for oil and gas industry professionals as well as scientists academic researchers students and policy makers

**Reactions And Synthesis In Surfactant Systems** John Texter, 2001-06-26 This work offers a comprehensive review of surfactant systems in organic inorganic colloidal surface and materials chemistry It provides practical applications to reaction chemistry organic and inorganic particle formation synthesis and processing molecular recognition and surfactant templating It also allows closer collaboration between synthetic and physical practitioners in developing new materials and devices

## Unveiling the Power of Verbal Beauty: An Mental Sojourn through **Surfactant Biodegradation**

In a global inundated with screens and the cacophony of quick connection, the profound energy and psychological resonance of verbal art usually disappear into obscurity, eclipsed by the constant barrage of noise and distractions. Yet, located within the lyrical pages of **Surfactant Biodegradation**, a interesting function of fictional brilliance that pulses with natural emotions, lies an unique journey waiting to be embarked upon. Penned with a virtuoso wordsmith, that magical opus instructions readers on a mental odyssey, delicately revealing the latent potential and profound affect embedded within the elaborate internet of language. Within the heart-wrenching expanse of this evocative evaluation, we can embark upon an introspective exploration of the book is central subjects, dissect their charming writing design, and immerse ourselves in the indelible impression it leaves upon the depths of readers souls.

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