

# Surfactants: Chemistry, Theory, and Application

DIRECTED BY

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2

Hours

ACCREDITED  
COURSE

- Surface Tension, Wetting, and Dispersion
- Interatomic Bonding and Intermolecular Attraction
- Foam Stabilization and De-Stabilization
- Measuring Methods of Surface Tension

## about the course

The high surface tension of water presents challenges to a formulator who attempts to develop products that will properly wet surfaces, disperse pigments, emulsify key components, or even generate or destabilize foam.

This accredited, 2-hour course on surfactants (chemistry, theory, mechanism, and application) initially reviews the various types and chemical structures of commercially available surfactants. An understanding of the role of interatomic and intermolecular attractive forces as it relates to surface tension is explored. The course progresses to a better understanding of various surface activities including surface area, surface tension, surface pressure, wetting, surface transport, and micelle formation. Then, we explore the world of foam with respect to how surface-active agents stabilize and de-stabilize bubbles at the surface or as entrained air. Finally, a review of surfactants as an aid to the dispersion process and the measurements of surface tension in both equilibrium and dynamic conditions.

Since this training is highly interactive, those attending the live training event must have a webcam on their computer as well as a microphone and speakers/headset to fully participate.

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## who should attend

This course is designed for research and development and business area personnel engaged in a wide array of industries including architectural paints, industrial coatings, printing inks, adhesives, pharmaceuticals, agrochemicals, personal care products, and cosmetics. It is targeted for formulation chemists as well as marketing, sales, and customer service personnel.

Managers and supervisors of the above-listed individuals would also benefit from this training by becoming acquainted with, and better understanding, the challenges involved with this technology.

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## learning objectives

### Upon completion of this course, you will be able to:

- Discuss Surfactant Types and Structures
- Explain Intermolecular Forces and its Influence on Surface Tension
- Identify Surface Activity including Pressure, Transport, and Micelle Formation
- Describe the Role of Surfactants in the Dispersion Process
- Explain Foam Stabilization and De-Stabilization
- Discuss Surface Tension Measuring Methods

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## course outline

### Review of Learning Objectives

#### Introduction to Surfactants

- Introduction and definition of Surfactants.
- The various types and chemical structures of surface-active agents are in use today.

#### Intermolecular Forces and Surface Activity

- A review of inter-atomic and inter-molecular bonding including covalent, ionic, Van der Waals forces, and hydrogen bonding that impact surface tension.
- The principles of various surface activities including surface tension, surface pressure, wetting, surface area, surface transport, and micelle formation.

#### Foam Stabilization and De Stabilization

- A clear understanding of how foam is generated, stabilized, and de-stabilized both on the surface and in the bulk as air entrainment.

#### Dispersion and Surface Tension Measuring Methods

- A review of surfactant technology as an aid to the dispersion of solid particles - pigments, extenders, fillers, and specialty additives.
- The course will conclude with a review of surface tension measuring techniques including static and dynamic surface tension instrumentation.

#### Question and Answer Session

#### Assessment Opportunity

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## course instructor

**Sam Morell** is a Chemical Engineering graduate of New York University and founder of samMorell.com. With over 50 years in the Chemicals industry, his experience includes both technical and marketing positions at Rohm and Haas, BASF, and Air Products and Chemicals. Mr. Morell has authored numerous technical articles on additives, pigments, and resins in various publications including PCI Magazine, Modern Paint and Coatings, The American Ink Maker, and Adhesives Age. He has been invited by various domestic and international industry symposiums, as well as Fortune 500 companies, to present both technical papers and educational courses. These include The American Coatings Show, The Waterborne Symposium, The European Coatings Show, and Coatings Trends and Technologies.

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## Accreditations



### **International Accreditors for Continuing Education and Training (IACET )**

Cobblestone has been approved as a CEU Accreditor by IACET and awards CEUs for participation in qualified courses. Cobblestone has demonstrated that it complies with the ANSI/IACET Standards and is authorized to offer IACET CEUs for its programs. CEUs will be awarded for participation in Cobblestone's courses at the rate of .1 CEU per contact hour upon successful completion of the entire course and 70% accuracy in the required Learners' Assessment. A minimum score of 80% is required for all courses within a Cobblestone Certification Program. This course offers a total of 2 contact hours or .2 CEUs. For further information, visit [www.iacet.org](http://www.iacet.org)

### **AIC- American Institute of Chemists**

Cobblestone is committed to enhancing the ongoing professional development of Cost Engineering professionals and other stakeholders through appropriate learning activities and programs. Many Cobblestone courses offer training that may be helpful in meeting the AACE continuing education requirements for recertification as a Certified Chemist, Certified Chemical Engineer, or Chemical Technician.

For more information about AIC, visit:

[www.theaic.org](http://www.theaic.org)