



Emulsion Polymers Consulting and Education, LLC presents

Molecular Weight Control in Emulsion Polymerization*



Hubble Space Telescope image -spiral arms in the galaxy Messier 63

***A 2-hour, On-line Tutorial
May 7, 2026***

Faculty

***Donald C. Sundberg, PhD
Michael F. Cunningham, PhD***

* Emulsion Polymers Consulting and Education (EPCEd) has a curriculum of 21 tutorials, treating both *fundamental* science/engineering topics and others treating *specialized topics*.

TUTORIAL OBJECTIVES: Despite having been practiced at commercial scales for more than a century, emulsion polymerization is increasingly the preferred reaction process used to create polymers of high molecular weight (MW) as aqueous based dispersions. Controlling the MW to desired levels is a bit more complicated in emulsion polymerization than in other reaction processes, yet completely necessary. This tutorial addresses the essential features of the emulsion process that determine the MW outcome. Extension of the discussions to the measurement of MW via GPC is included.

INTENDED AUDIENCE: This tutorial has been designed to introduce those relatively new to this field to the chemical and physical principles involved in controlling the polymer MW produced in emulsion polymerization. Those more experienced will likely see new options to anticipate MW changes when process changes occur (e.g. monomer feed rates or reaction temperature) or when considering changes to the type of chain transfer agents.

STRUCTURE OF THE TUTORIAL: This on-line tutorial will be presented during a 2-hour period starting at 9:30 AM (EDT) on May 7, 2026. Participants will have received all the PPT slides prior to the date of the on-line session. Questions can be placed in the on-line Chat Box during the session and discussed in a 30- minute session immediately following the formal presentation.

WORKSHOP OUTLINE: See next page for a topical outline. Faculty profiles follow on page 3.

REGISTRATION INFORMATION

The registration fee includes the tutorial PPT slide deck delivered to the registrant's home or business email address. Presentations will be made on-line via Microsoft Teams. ***Early registration is recommended*** due to the tutorial size limitation of 30 participants.

Registration Fee: ***\$450 USD***
Registration Form – ***Go To Page 4***

Contact for further information:

info@epced.com

Molecular Weight Control in Emulsion Polymerization

1.) Free radical polymerization

MW averages and distributions, instantaneous and cumulative MWs for homopolymers

2.) Basic experimental parameters controlling MW development

Conceptual aspects leading to analysis

3.) MW development in bulk and solution polymerization

Details of bimolecular termination reactions including effects of viscosity

4.) Emulsion polymerization – Batch reaction mode – no CTA added

Influence of EP mechanism for time intervals 1, 2, 3. Chain starting and stopping events. Importance of monomer concentration in the latex particles

5.) Emulsion polymerization – Batch reaction mode – with CTA added

Additional MW control via CTA. Introduction to chain transfer constants. Influence of CTA on polydispersity of chain lengths

6.) Emulsion polymerization – Semi-batch reaction mode – no CTA added

Getting started with creating latex particles. Effect of monomer feed rates on reaction rates and MW development, both averages and distributions

7.) Emulsion polymerization – Semi-batch reaction mode – with CTA added

Combined effects of monomer feed rate and CTA level. Chain transfer constants for emulsion polymerization vs. bulk/solution polymerization.

8.) Measurements of MW and MW Distributions

*Size exclusion chromatography (SEC) and gel permeation chromatography (GPC). Instruments and separation columns, detectors and calibrations. Determining **absolute** MWs*

Faculty Profiles

Professor Donald C. Sundberg has been working in the field of emulsion polymers for 54 years. He received a bachelor's degree in chemical engineering from Worcester Polytechnic Institute (Massachusetts) and his Ph.D. from the University of Delaware. He worked on latex based impact modifiers for ABS resins with the Monsanto Company, scaling processes to the 10,000 gallon reactor size. He has extensive research experience in emulsion polymerization and is widely recognized for his work on structured latex particles. This has resulted in over 100 peer reviewed publications and many conference papers. In addition, he has conducted many workshops, most notably the one on latex particle morphology control. He spent a sabbatical year at the Institute for Surface Chemistry in Stockholm and was Chair of the 1997 Gordon Research Conference on Polymer Colloids. He is the 2016 Mattiello Memorial Lecture awardee from the American Coatings Association. His research interests are in polymerization kinetics in solution, bulk and emulsion systems, interfacial science and polymer morphology control, diffusion in polymers, and coatings. He is an Emeritus Professor of Materials Science at the University of New Hampshire and is the founder of Emulsion Polymers Consulting and Education, LLC.

Professor Michael F. Cunningham has an extensive background in dispersed phase polymerizations, including suspension, emulsion, miniemulsion and dispersion polymerization. He received a bachelor's degree in Engineering Chemistry from Queen's University (Kingston, Ontario, Canada) and his Ph.D. from the University of Waterloo. He spent six years working on dispersed phase polymerizations in the Xerox Corporate Research Group, acquiring experience in process scaleup and technology transfer to manufacturing. He has an active research program in polymer colloids and emulsion polymerization, particularly in the area of living radical polymerization and stimuli-responsive particles, publishing over 250 peer reviewed publications, and holding 26 U.S. patents. He is secretariat of the International Polymer Colloids Group, and previously held the Ontario Research Chair in Green Chemistry and Engineering. He has consulted with a number of companies in the area of emulsion and suspension polymerization, and lectured for over 10 years at industrial short courses on emulsion polymerization in the USA and Switzerland. He is a Partner with Professor Sundberg in the international consulting firm Emulsion Polymers Consulting and Education, LLC.

**Molecular Weight Control in Emulsion
Polymerization**

On-line tutorial

May 7, 2026

Registration Form

Name _____
Address _____

City/State _____
Postal Code _____
Country _____
Position or Title _____
Organization _____
E-mail _____

The cost of this tutorial is \$450 (USD). There is a non-refundable fee of \$60 (USD). Cancellation of registration can be made up until April 7, 2026 with a full refund less a \$60 processing fee.

Method of Payment:

- Credit Card (We accept Visa, MasterCard, American Express)

Please use this link to SwipeSimple to pay by credit card:

https://swipesimple.com/links/lnk_5bfef3219946dd236ab356663488f8b7

- Wire transfer from bank --- Please go to info@epced.com and request banking instructions.
- Company check (make payable to Emulsion Polymers Consulting and Education, LLC, 39 Nute Road, Madbury, NH 03823, USA)

Please submit this registration form as an attachment to info@epced.com. This registration form may serve as an invoice for those who register.