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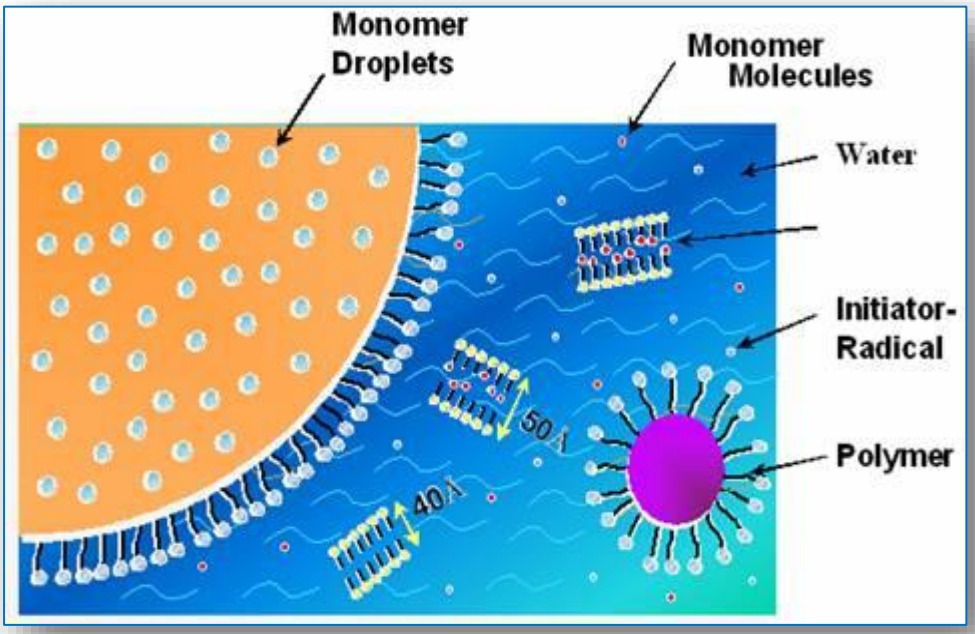
International Centre For Training & Development




# PCE242

# Advances in Emulsion Polymerization and Latex Technology

# Course Introduction:

The five-day course is an in-depth study of the synthesis, characterization, and properties of high polymer latexes. The subject matter includes a balance of theory, applications and practical problems as well as a balance between chemical and physical problems.

# Course Objectives:

**Upon successful completion of this course, the delegates will be able to:**

- ✓ Determine Kinetics of free radical-initiated polymerization and emulsion polymerization mechanisms and kinetics as well as emulsion polymerization and structured latexes
- ✓ Familiarize the role of surfactants in emulsion polymerization, branching and grafting in emulsion polymerizations and latex rheology
- ✓ Determine living radical polymerization and recent advances in emulsion polymerization
- ✓ Determine stabilization mechanisms in aqueous and non-aqueous latexes
- ✓ Gain knowledge in the structure of model coatings vs. Pigment concentration and the effects of coalescence and interfacial crosslinking on the mechanical properties of latex films
- ✓ How to use and apply sensors and control of emulsion polymerization reactors

# Who Should Attend?

The course is designed for process engineers, chemical engineers, scientists, research & development and other laboratory and technical staff who are actively involved in emulsion work, as well as for those who wish to develop expertise in the area. A basic background in chemistry will be assumed.

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# Course Outline:

***Day 1:***

- ✓ Kinetics of free radical-initiated polymerization
- ✓ Emulsion polymerization mechanisms and kinetics
- ✓ Semi-continuous emulsion polymerization and structured latexes

***Day 2:***

- ✓ The role of surfactants in emulsion polymerization
- ✓ Engineering of emulsion polymerization reactors
- ✓ Branching and grafting in emulsion polymerizations
- ✓ Latex rheology

***Day 3:***

- ✓ Discussion of applications and problems submitted by course participants
- ✓ Stabilization mechanisms in aqueous and non-aqueous latexes
- ✓ Latexes for industrial applications and methods of reducing residual monomers
- ✓ Film formation

***Day 4:***

- Miniemulsion polymerization and latex systems
- Living radical polymerization and recent advances in emulsion polymerization
- Water-borne pressure-sensitive adhesives
- Effects of reactor agitation on coagulum formation

***Day 5:***

- ✓ The structure of model coatings vs. Pigment concentration and the effects of coalescence and interfacial crosslinking on the mechanical properties of latex films
- ✓ Sensors and control of emulsion polymerization reactors

# Course Certificate:

**International Center for Training & Development** (**ICTD**) will award an internationally recognized certificate(s) for each delegate on completion of training.

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# Course Methodology:

**A variety of methodologies will be used during the course that includes:**

- (30%) Based on Case Studies
- (30%) Techniques
- (30%) Role Play
- (10%) Concepts
- Pre-test and Post-test
- Variety of Learning Methods
- Lectures
- Case Studies and Self Questionaires
- Group Work
- Discussion

- Presentation

## Course Fees:

**To be advised as per course location.** This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

## Course Timings:

**Daily Course Timings:**

| | |
|---|---|
| 08:00 - 08:20 | Morning Coffee/Tea |
| 08:20 - 10:00 | First Session |
| 10:00 - 10:20 | Recess (Coffee/Tea/Snacks) |
| 10:20 - 12:20 | Second Session |
| 12:20 - 13:30 | Recess (Coffee/Tea/Snacks) |
| 13:30 - 15:00 | Last Session |

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