



RHEOLOGY BOOT CAMP

January 12 & 13, 2022

Norman Wagner, Univ. Delaware

Colburn Laboratory Rm 366

Classroom: 9:00 am – 12:30 pm

Zoom Link: <https://udel.zoom.us/j/97510576894>

50 minute modules with 10 minutes break and Q&A..

Day One

1. Rheological Concepts and Rheological Phenomena

- a. Overview of rheological phenomena
- b. Kinematics of shear flows
- c. Dynamics: stresses
- d. Extensional flows
- e. Basic rheological concepts
- f. Simple constitutive models
- g. Types of rheometers

2. Polymer and Polymer Solutions Rheology Basics

- a. Polymer science basics
- b. Rheological phenomena associated with elasticity
- c. Reptation
- d. Generalized Newtonian & Maxwell models
- e. Normal stresses
- f. Time-Temperature Superposition

3. Rheological Measurements

- a. Rheometer basics
- b. Rheological tooling, what, when, where and why?
- c. Measurement strategies
- d. Problems & mistakes!

Lunch Break

Afternoon Practical Rheology Training in Laboratory

Day Two

4. Colloidal Suspensions:

- a. Definition of a colloid
- b. Hydrodynamic effects
- c. Brownian motion
- d. Hard sphere suspensions
- e. Stable suspensions
- f. Non-spherical particles
- g. Measurement strategies

5. Colloidal Gels & Glasses

(Dr. Khushboo Suman)

- a. What is a colloidal gel and their types?
- b. Structure of gels
- c. Linear viscoelasticity of gels
- d. Advanced topics, nonlinear behavior and aging
- e. Measurement strategies

6. Advanced Topics:

a. Thixotropy

- i. Concept of thixotropy
- ii. Experimental features
- iii. Modelling methods

b. Interfacial Rheology

(Dr. Benjamin Thompson)

- i. Definitions and concepts of surface rheological properties
- ii. Instrumentation and methods
- iii. Example

Lunch Break

Afternoon Practical Rheology Training in Laboratory