

PRACTICAL RHEOLOGY FOR CHEMISTS

Training, Method Development and Advice

Practical Rheology for Chemists is a highly-regarded programme of tuition, practical work and support that ensures manufacturers obtain the most benefit and financial return on investment from their rheometers and viscometers. The comprehensive programme, which can be tailored to meet the needs of new and experienced rheometer users alike, typically comprises:

1. A solid grounding in core principles of rheology and viscosity relevant to your specific applications, products and skill levels.
2. Practical demonstration of a “rheologist’s toolkit” of parameters and test methods to meet product development, stability, process design and quality control needs.
3. Development and validation of finished working test methods.
4. Six months of follow-on support and advice by email and telephone

“If you've ever sat through a rheology course and still not grasped the more practical concepts I would recommend you get in touch with Neil Cunningham ”

Procter & Gamble

“I have never had such positive feedback from a technical training course before and would recommend this to anyone who has ambitions to get more out of their rheometer”

PZ Cussons

DAY ONE: VISCOSITY PROFILING

Principles:

- Viscosity, shear stress and shear rate
- Newtonian and non-Newtonian flow behaviour
- Understanding the anatomy of the flow curve
- Yield stress: What is it and how does it influence product flow behaviour?
- Understanding thixotropy and its implications: viscosity build after manufacture, fluctuating rheometer and viscometer readings.

Practice:

- Introducing the “Rheologist’s Toolkit”
- Viscosity profiling methods: Stress and shear rate sweeps, stepped ramp and steady state flow, stepped rate thixotropy tests.
- Quantifying viscosities, yield stress and thixotropy.

- How to use simple flow models to quantify flow behaviour: Cross, Bingham, Herschel-Bulkley, Power Law
- “Rheometer or viscometer?” and “cone, plate or spindle?” decisions.
- “Tricks of the trade” for dealing with difficult materials: Set gels, slurries, particulates and settling samples.
- Identifying and dealing with erroneous data due to slip and sample fracture etc.

DAY TWO: VISCOELASTICITY AND ITS MEASUREMENT.

Principles:

- Understanding the concept of viscoelasticity: What does it mean to have elastic behaviour in a fluid and how does it manifest itself in “real-life” flow behaviour?
- De-mystifying the parameters: What do G^* , G' , G'' and δ mean in the real world?

Practice

- Oscillatory testing: Principles and available test types:
 - Stress and strain sweeps – principles and when to use them.
 - Frequency sweeps and their use for stability testing etc.
 - Pre-shear/recovery methods for thixotropic analysis and storage changes
- Creep testing:
 - Setting the experiment parameters, quantifying and interpreting the results.

OPTIONAL DAY THREE: PROJECT / PRODUCT SPECIFIC TEST METHOD DEVELOPMENT AND CONSULTANCY

Typically comprising one-to-one or smaller group focused sessions working on specific current issues:

- Assessment of the required flow behaviour of current products / finished formulations.
- Development of methods to identify and predict those behaviours
- Initial validation of candidate test methods
- Production of draft Standard Operating Procedures.

SIX MONTH EMAIL AND TELEPHONE SUPPORT PERIOD

Six months of email and telephone support following the visit during which all attendees can send any questions or newly-gained data for comment. The support period is highly effective in ensuring new methods are implemented correctly and all new concepts are thoroughly understood.