

Chemical Engineering Seminars – TT 2011

*Week 2, Tuesday May 10th 2011, 4:00PM-5:00PM
Lecture Room 3, Thom Building, Engineering Science*

Mixed Biopolymer Aqueous Solutions - Phase behaviour and rheology.

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Abstract

Biopolymers are employed as thickeners and stabilisers in a variety of food and personal care products, frequently in the form of a solution or gel that is composed of more than one protein or polysaccharide. Such mixtures display a complex phase behaviour leading to the formation of multiple liquid phases with different compositions and properties. Understanding the origins of this behaviour and the impact that it has on the bulk rheological and stability properties of the mixtures is of crucial importance to successful product design and formulation.

This talk will cover the following topics:

- A brief introduction to biopolymer solution mixtures and how they compare to polymer blends and emulsions.
- The phase diagram, compositions and viscosities of the phases that typical biopolymer mixture can form.
- Interfacial tensions in phase separated biopolymer mixtures, and why they are lower than those encountered in emulsions. Implications of this for the droplet deformation, break-up and coalescence behaviour.
- The rheology of biopolymer liquid mixtures, and modelling of their behaviour.
- The use of long relaxation timescales combined with gelation for the production novel gel particle and composite morphologies.

Bio

William was introduced to rheology during my undergraduate training when he undertook an industrial placement at ICI Paints Division under the supervision of Trevor Strivens. Through this he was offered the possibility of studying for a Doctorate at Leuven University Under the supervision of Jan Mewis. After completing his doctorate entitled "The Rheology of Well Characterised, Non-Aqueous, PMMA Suspensions" he returned to ICI this time to work at the Corporate Colloid Science Group with Richard Buscall. Subsequently he moved to Unilever R&D at Colworth House in Bedfordshire where he has spent the last 18 or so years, working primarily on the rheology of food related materials, though recently he have moved into the field of skin and hair care ingredients and products.