

High Temperature Surfactancy for Cleanliness in Modern Engines

Industry-funded PhD in Colloid and Interface Science in the School of Chemistry, University of Bristol

Bristol Supervisor: Prof. Julian Eastoe Infineum supervisor: Prof. Peter Dowding

The aim of the PhD is to study self-assembly of surfactants in non-aqueous solvents under extreme conditions, especially high temperatures as are experienced in modern efficient internal combustion engines. The programme builds on the extensive experience at Bristol in colloid and interface science and developing surfactant systems with tailored self-assembly. Families of model surfactants with systematic variations in structure will be utilised and the self-assembly studied in non-aqueous solvents. Phase behaviour studies, interfacial tensiometry and small-angle neutron scattering and neutron reflection at both Rutherford Appleton Laboratories (Didcot, UK <https://www.isis.stfc.ac.uk/Pages/home.aspx>) and Institute Laue Langevin (Grenoble, France <https://www.ill.eu/>) will be utilised. Other facilities external to Bristol will be used at Infineum (Abingdon, UK).

Specifically this PhD will investigate solution phase behaviour (and associated surfactant degradation) of surfactants in non-aqueous media and also to understand the mechanism(s) of surfactant adsorption and removal of predominately carbonaceous deposits on hot metal surfaces.

This PhD links strongly with other Infineum PhD programmes: experimental tribometry and neutron reflection (Cambridge, Bristol), computer simulation (Edinburgh) and model polymer synthesis (Warwick), and cross-university collaborations will be developed.

Interested and suitably qualified candidates should make informal contact at with Professor Julian Eastoe Julian.eastoe@bris.ac.uk (<http://orcid.org/0000-0001-5706-8792>) before Friday 29 June 2018. The intended start date for the project is 24 Sept 2018. After contacting Professor Eastoe, you may then apply using the University of Bristol on-line application system.