# EPSRC supported EngD project. Design and Optimisation of Surface Actives for Sustainable Hygiene Products

## Prof Jason Zhang ( Chemical Engineering, Univ of Birmingham )

## Innospec ( Ellesmere Port, Cheshire )

## Tax free bursary of £ 25,000 plus fees paid

Wet wipes, coming in different shapes and forms such as baby wipes, wet towels, antibacterial hand wipes, medical textiles, are essential to our daily life as a practical hygiene and cleaning product. Global market for wet wipes was around 15.2 Billion USD in 2022, and is projected to reach 33.8 Billion USD by 2030. The sector has transitioned from using non-degradable polymer such as PE, PP, PET as substrate to biodegradable polymer in recent years, upon environmental concerns such as fatbergs accumulated in sewage system and formation of microplastics. However, to reach the ultimate sustainability for flushable, premoistened nonwoven wipes, e.g. use less, clean better, surface actives play an indispensable role.

The aim of this project is to design and optimise innovative surface actives used in wet wipes to accomplish excellent surface cleaning. There is a rich science in improving the sustainability profile of a practical product, including transport phenomena in porous matrix, hydration kinetics of polymeric matrix, emulsification, interfacial displacement, which are supplemented with multiphysics simulation (e.g. COMSOL). Techniques to be used include a custom-build micromanipulation, Nanoindentation, contact angle goniometer, interfacial tensiometer, UV-vis, SWIR hyperspectral imaging, and confocal microscopy.

It is envisaged that the project will identify and/or optimise a series of novel surfactants, test them against a wide range of application conditions, and develop sustainable hygiene products whereby resources required will be kept at a minimal level.

To be eligible for EPSRC funding candidates must have at least a 2(1) in an Engineering or Scientific discipline or a 2(2) plus MSc. To apply please email your cv to [cdt-formulation@contacts.bham.ac.uk](mailto:cdt-formulation@contacts.bham.ac.uk). Currently we are only able to accept UK nationals. For details on the Engineering Doctorate scheme visit the [homepage](http://www.birmingham.ac.uk/schools/chemical-engineering/postgraduate/eng-d/index.aspx).

**Deadline: 12th April 2024**