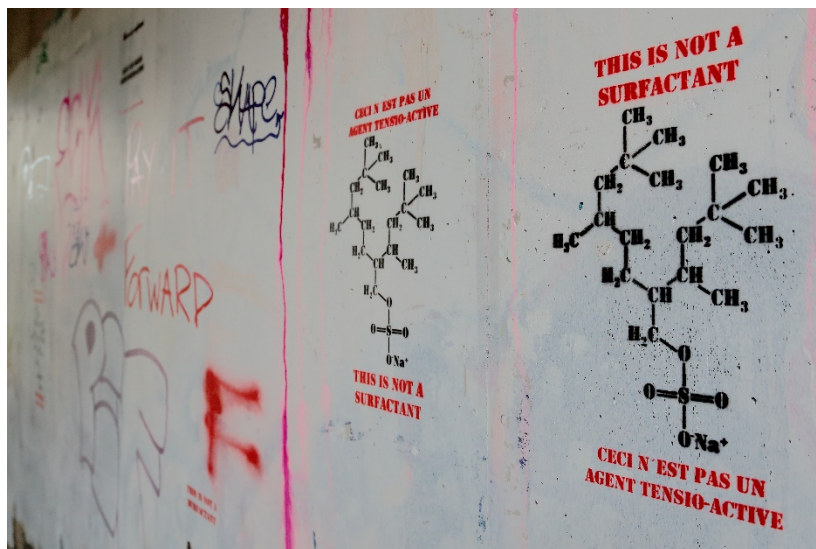


New environmentally safe non-fluorinated surfactants for fire-fighting foams

About the project or challenge area: Certain surfactants and polymers contain fluorine, giving them desirable properties such as chemical and thermal stability, as well as high surface activity needed for stabilizing interfaces and foams. These fluorinated chemicals are known as perfluoroalkyl substances (PFAS), and because they do not breakdown they have been dubbed “[forever chemicals](#)”. Hence, for sound environmental reasons, PFAS must be phased out. However, replacing these “forever chemicals” with fluorine-free analogues is easier said than done! [Recent research at Bristol](#) has shown how to attain the beneficial physical and chemical properties of fluorinated surfactants, but with newly designed molecules which are totally fluorine-free (see below).

Why choose this opportunity? The focus of your project will be on surfactants, polymers and colloid and interface science which will provide an excellent platform to learn about the design of functional materials and their practical applications. Your work in this area can make a real impact on global challenges, such as environmentally responsible fluorine-free surfactants for high volume applications such as waterproof coatings (e.g. Gore-Tex) and fire-fighting foams. You will develop and increase your expertise in broad chemical synthesis and characterization techniques, whilst becoming familiar with the fundamentals of colloid and interface science. Furthermore, this project will require your collaboration with other members



across other research groups, thus improving your teamwork and networking skills. You will also develop a range of transferable skills, including presentation, scientific writing, and project and time management. Finally, you will be interacting with students from all over the world learning from their culture and skills, adding to your professional and personal development.

Full training will be provided for all aspects of this project. You will be embedded in the Supervisor's research group, who will provide support. In addition, you will be assigned a mentor for the duration of your project, who will provide extra support and help you to identify any additional training needs or opportunities.

About you: Ideally you will already have skills and knowledge in general preparative chemistry, analytical methods, and colloid science, teamwork and time management.

Bench fees: A bench fee of £5,500 is required.

How to apply: Applications are accepted throughout the Academic Year, and you should complete the online application form for Chemistry (MSc by Research).

Supervisor: Your supervisor for this project will be Julian Eastoe, Professor Chemistry in the School of Chemistry. You can contact him at +44 (0) 117 928 9180 or email Julian.Eastoe@bristol.ac.uk

Find out more about your prospective research program: This review article explains the general background to fluorine-free surfactants:

Surfactants at the design limit

Langmuir, 2015, 31, 8205–8217
<https://pubs.acs.org/doi/abs/10.1021/acs.langmuir.5b00336>

