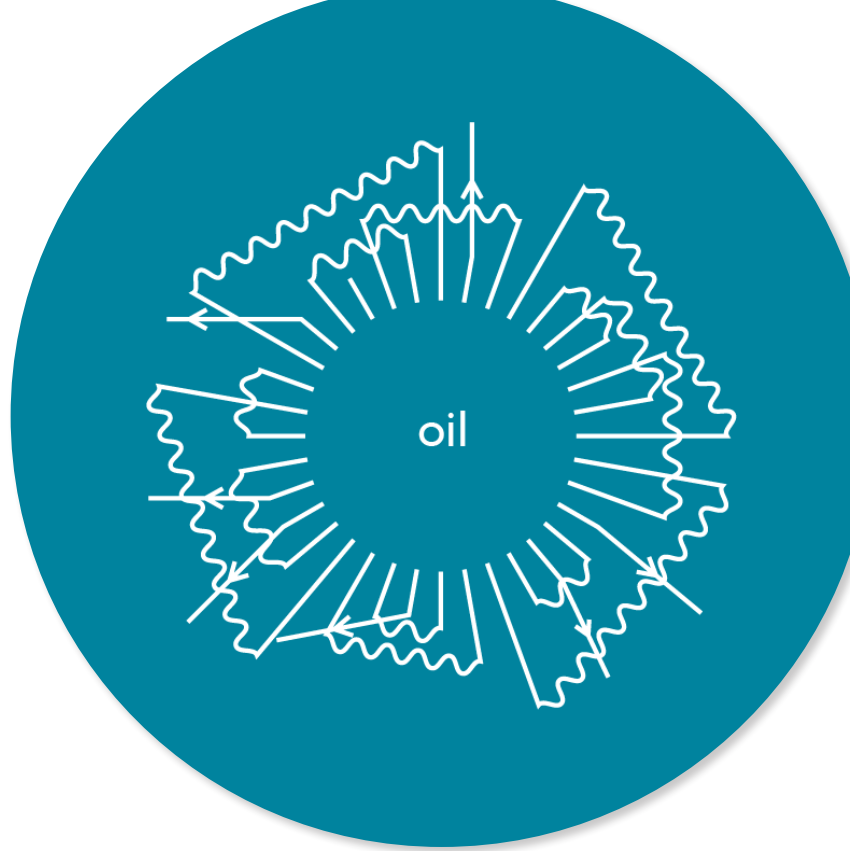


Oil research using Diamond



We remain reliant on fossil fuels for our current and future energy supply and one of the greatest challenges facing scientists today is to make the most efficient use of our resources. This drive for increased efficiency affects all aspects of the oil industry from upstream enhanced oil recovery technologies to downstream refining processes through to lubricants, additives and coatings.

Located in South Oxfordshire, a region widely recognised for a strong technology business focus, the Diamond Light Source is a sophisticated synchrotron light facility which can generate highly intense beams of light ranging from IR and UV to X-rays, all of which are making research at the cutting edge of modern science possible. Diamond provides specialist analytical techniques for the atomic to microscale characterisation of materials ranging from crude oil, petroleum additives, lubricants and anti-corrosion coatings through to the next generation of catalysts for refining.

In order to facilitate the use of Diamond by researchers working in industry, an Industrial Liaison team has been established, comprising highly qualified scientists experienced in a range of technique areas. This team can help to translate your research problem into an analytical solution by making use of its diverse expertise in synchrotron methods.

Depending on your specific requirements, we offer a range of service levels:

- **Beamtime only – you come to Diamond and collect your own data**
- **Data collection service – we collect your data and send it to you for analysis**
- **Full analysis service – we collect and analyse your data and present your with a detailed report**

Some examples of ways in which Diamond can provide research and development solutions for the oil industry are outlined overleaf.

For further information please contact the Diamond Industrial Liaison Office on



+44 1235 778797

industry@diamond.ac.uk

www.diamond.ac.uk/industry

@DiamondILO

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Upstream Exploration & Production

- Structural investigations of complex functional materials, e.g oilfield fluids;
- Study solid-solid and solid-liquid interfaces including clay and mineral systems;
- Analyse particle shape, particle growth and size distribution in colloidal suspensions including asphaltenes.



Downstream Processing

- Investigation of catalyst behaviour under *in situ* conditions;
- Follow corrosion processes under realistic conditions;
- Structural and chemical information to aid the development of high performance materials and coatings;
- Element specific detection of contaminants even at very low concentration.



Fuels, Chemicals & Additives

- Structural identification and characterisation of crystalline solids and waxes;
- Understand interfacial phenomena relating to friction, lubrication and wear;
- Examine surface structure and ordering in thin films and coatings;
- Explore phase behaviour in oil additives, detergents and lubricants.



Pipeline and Processing

- Follow chemical composition changes during corrosion;
- Detect the presence of specific element contaminants;
- Uncover the chemical composition of worn films;
- Non destructive testing of failure and fatigue in pipes and welds;
- Image microscale cracks and pores in pipes and welds.



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