



Industrial research using Diamond

NUCLEAR

The eternal dream to explore matter at its deepest level has continually driven scientists to build more and more powerful instruments from simple microscopes to elaborate X-ray sources.

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 as diverse as novel pharmaceuticals, catalytic materials, coatings, motor oils, and large engineering components.

Our dedicated Industrial Liaison Team of highly skilled

scientists is available to support you in every step of your research. The team can help to translate your R&D challenges into meaningful analytical solutions by making use of its diverse expertise in synchrotron methods.

Some examples of how Diamond can be used for nuclear research are outlined overleaf.



Applications

Waste Management

- Detect and identify radionuclide chemical species from contaminated land and waste;
- Image damage, cracks and voids in containers to understand failure mechanisms;
- Understand chemical processes relevant to geological disposal facility design and maintenance.



Decommissioning

- Develop and characterise new materials and coatings;
- Analyse chemical speciation at the atomic and molecular scale by spectroscopic and diffraction techniques;
- Follow chemical reactions in extraction of transuranic elements.

Interaction With Environment

- Probe radionuclide interactions with ground water and environmental systems;
- Investigate geomicrobiology in the presence of radionuclides using spectroscopic techniques;
- Monitor and identify the evolution of mineral phases by X-ray diffraction or spectroscopy.

Storage Materials

- Assess performance of materials such as stainless steel, concrete and zirconium cladding for long term radwaste storage;
- Detect corrosion processes in storage materials;
- Obtain experimental data to inform predictive modelling approaches.

SF-NUC-015-2



For further information

Diamond Industrial Liaison Team

☎ +44 1235 778797

✉ industry@diamond.ac.uk

🌐 diamond.ac.uk/industry

🐦 @DiamondILO