

The *DARTS* Challenge

We are keen to learn how we can support your materials analysis requirements. This is likely to be in tackling characterisation issues which are beyond the power or sensitivity of your lab equipment. To help us interpret your needs and match them to our capabilities we offer you a FREE consultancy on the material structure challenge of your choice. This could unlock a stalled R & D project, save waste on a process or help you de-mystify some hitherto 'black art'. Please complete and return the *DARTS* challenge questionnaire below:

The *DARTS* Challenge Questionnaire

(Please cut out and return to E J MacLean, *DARTS* at Daresbury Laboratory, Warrington, Cheshire WA4 4AD)

Contact Name _____

Company _____

Phone no _____ email _____

Material(s) of interest _____

Material form(s) of interest _____

My Materials Structure Challenge to *DARTS*:

- I claim my free consultation on this materials analysis challenge.
- Please contact me to arrange this.
- I would like to visit Daresbury and tour the synchrotron/
I would prefer the consultation to take place at my company.
(Please delete as appropriate).



Welcome to this brand new newsletter dedicated to keeping you informed about what's happening at *DARTS* that's of special interest to the chemical industry. As you may know *DARTS* is the leading edge analytical research service available at Daresbury Laboratory near Warrington, Cheshire.

If you're aiming to understand materials – *DARTS* hits the target!

Why leading Edge?

Because *DARTS* has access to the UK's only synchrotron which is not only over 100 times brighter than any lab spectrometer but produces light at all relevant wavelengths. There are over thirty experimental stations supported by experienced scientists and technicians ready to solve the analytical challenges you face.

If you haven't heard of *DARTS*, why not call the number at the end of the newsletter and arrange a free consultation with a member of the *DARTS* staff. We'd be pleased to give you a tour of the synchrotron and related facilities.

DARTS grows its sales team

DARTS is already the advanced analysis partner chosen by some of the biggest companies in the world - and by some of the smallest! However, we're not resting on our laurels. The service was relaunched in October 2000 at a Technology Workshop and the new marketing strategy concentrates on priority market sectors – including Chemicals & Specialities.

To handle the additional sales opportunities we have sequestered a team of willing experts to ensure all new customers can be satisfied. In the chemicals sector the team is:

Chris Pickles

Chris joined *DARTS* two years ago after spending 25 years in the chemicals and related industries including spells as head of R & D at Laporte and as MD at Solvay Automotive Ltd.



Graham Bushnell-Wye

Graham leads the X-ray diffraction team at Daresbury and has twenty years experience of resolving material structures. The facilities are now at the point where crystal structures can be determined without 'crystals'



Andy Dent

Andy leads the X-ray spectroscopy team at the lab. He has fifteen years experience with this technique, which is unique to synchrotrons, and allows the atomic environment of metal ions to be resolved in any amorphous, glassy, liquid or crystalline material.



Elizabeth MacLean

Elizabeth joined DARTS three years ago after doing research into the solid state properties of organic compounds. She has conducted extensive X-ray diffraction studies for many DARTS customers.



Elsewhere in the newsletter we invite you to challenge us with your difficult goals in materials characterisation. The team is all set to put the power of the synchrotron at your disposal. Please read the case histories to find out about the things we've done already and the wide range of materials we have addressed.

Want to find out more?

To contact us call 01925 603 141
or fax 01925 603 124
or email darts@dl.ac.uk

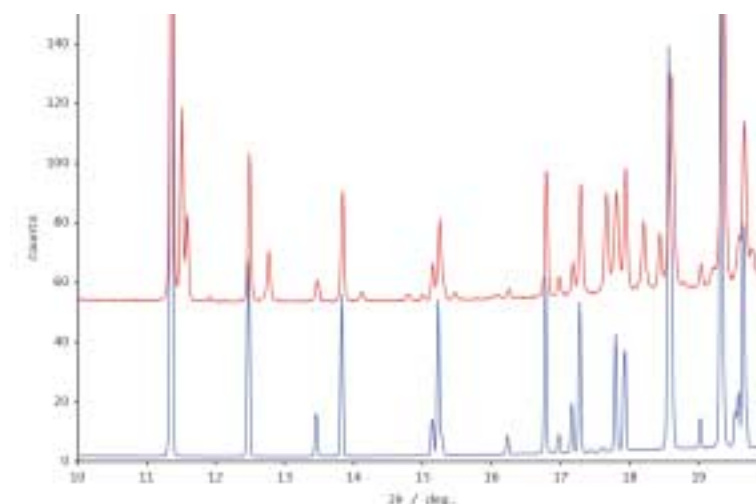
You can reach Graham on: 01925 603623 g.bushnell-wye@dl.ac.uk
Andy on: 01925 603629 a.j.dent@dl.ac.uk
Elizabeth on: 01925 603193 e.j.maclea@dl.ac.uk
and Chris on: 01925 603148 c.j.pickles@dl.ac.uk

Chemical Solutions ...

Targeting Product Properties

Polymorphs are important in many industries from pharmaceuticals through agrochemicals to pigments, where it is vital that potential problems associated with their different solid state physico-chemical behaviour are known about early in the development process. Many of the world's largest chemical companies have

used high-resolution powder diffraction and single crystal diffraction facilities on the SRS to study polymorphism. Recently, several companies have obtained data to be used in litigation when they suspected their patents were being infringed.

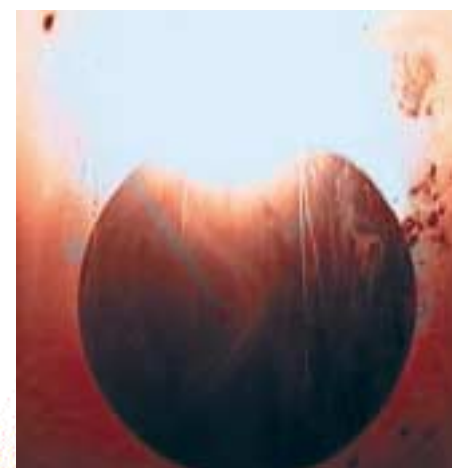


Above: 'Finger print' diffraction patterns from the same substance in different forms.

Riding the Chain reaction

Synchrotron radiation has been used effectively to monitor the evolution of high-speed self-propagating reactions and assist in defining external parameters (such as magnetic field strength) which influence the synthesis of novel phases. In one recent study, the starting material took the form of a ferrite disc (shown

in the picture) which approached 2000°C in 30 seconds: conventional techniques are simply too weak to record X-ray diffraction patterns in fractions of a second which was required to reveal the atomic-level structure of transient intermediate phases present in the reaction.



Exploding ferrite discs: temperatures of up to 2000°C are generated in a fraction of a second.

Above: Fireworks in action: a ferrite disc reaches 2000°C in 30 seconds.