

Rapid Access for Beamtime on I11 – Trial Arrangements

1. Aims and Purpose

The objective of Rapid Access mode is to provide an administrative mechanism for the collection of powder diffraction data on samples that are timely and of potentially high scientific interest and whose measurement requires access to a short duration of beamtime (e.g. a few hours or less). It is not intended as a source of beamtime for the routine measurement of large numbers of samples, or for lengthy projects more appropriate to the normal beamtime application procedures.

Researchers wishing to run samples must submit an electronic [Rapid Access Proposal](#), details of which are available on the DLS website or from the User Office.

Rapid Access has been conceived as a remote access mode; proposals will be submitted and reviewed online, samples will be sent by post or courier to Diamond and any resulting data will be accessed online.

2. Safety Considerations

Only low-risk materials may be submitted via this route. **The following materials are not acceptable:**

- Radioactive materials
- Highly reactive samples (e.g. explosive, ...)
- Biohazardous materials

Full hazard declarations must be included with the proposal and also must accompany the samples sent to DLS. Any delivered samples that deviate, or appear to deviate from their stated or declared hazard rating will be treated as potentially hazardous waste and destroyed accordingly without progressing to data collection. Applicants who are considered to have deliberately attempted to circumvent these restrictions will not be allowed to resubmit further samples/applications.

3. Technical Protocol

A standard data collection protocol will be used:

1. Data will be collected at room temperature using the multi-analysing crystal (MAC) system and robotic sample changer.
2. The energy of the x-ray beam will be 15 keV ($\lambda \sim 0.826 \text{ \AA}$).
3. The angular range of the data will be $2\theta = 3 - 150^\circ$, binned at 0.001° step and collected for a standard scan time of 1 hour. A silicon scan is shown below for reference (Figure 1).
4. The final data file will be a 3 column data file (2θ , Intensity, Error). Any further data handling and analysis is the responsibility of the user.
5. Powder specimens must be loaded and sealed into 0.5 or 0.7 mm (diameter) glass-capillary with a sample length of 40-60 mm (Figure 2). The length is important so that it can easily be mounted on to the brass tip ready for the measurement (Figure 3).

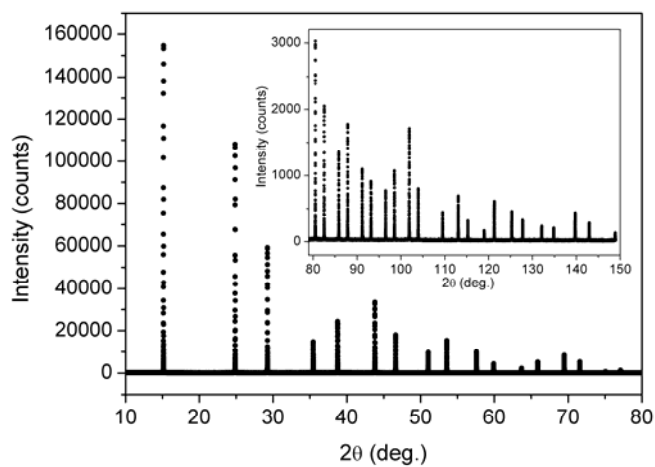


Figure 1. A 1 hour silicon scan (NIST SRM 640c) on Beamline I11, collected with the MAC detector system at 15 keV. Data collected 10-150 degrees the inset shows the higher angle peaks (80-150 degrees).

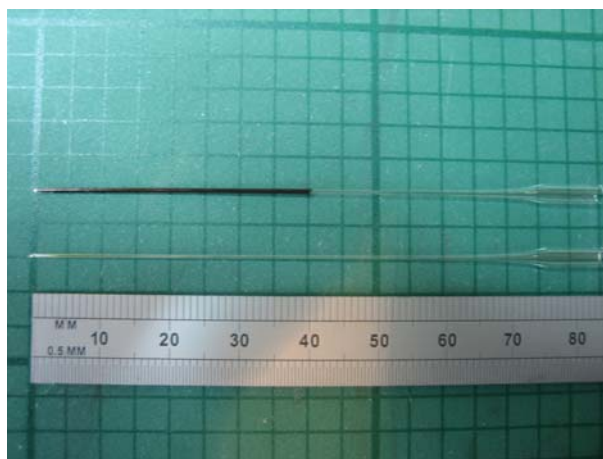


Figure 2. Empty (bottom) and loaded borosilicate glass capillary (top) with 40 mm powder material



Figure 3. Loaded capillary attached to the brass tip ready for data collection

6. The use of **borosilicate glass capillaries** is preferred. Care should be taken when choosing and sealing a capillary to provide a straight ended specimen (see Figures 2 and 3) such that it can be mounted on the brass holder.
7. If a sample cannot be correctly mounted on the brass holder the user may be requested to send a replacement.
8. If possible, it will be preferred if users can send two prepared samples.
9. Samples should be delivered to Diamond by post or courier (see Section 6 for the postal address).
10. Unless special arrangements have previously been agreed with beamline staff, samples will be disposed of 2 weeks after data collection.

For queries on loading samples please contact Dr. Julia Parker (Tel: +44 (0)1235 778924 e-mail: julia.parker@diamond.ac.uk)

4. Beamtime Scheduling

1. During the trial periods Rapid Access beamtime will be scheduled every month. Each session will have a maximum duration of 1 day
2. It is proposed that the total 6 days (22 hour per day) is reserved for Rapid Access in each allocation period (AP). Therefore 132 samples could be measured in each AP
3. No guarantee can be offered by either DLS or I11 that samples will be run as scheduled, due to the possibility of unforeseen machine or beamline problems.
4. No liability will be accepted by DLS or I11 for any damage to or loss of sample during mounting/dismounting on the instrument prior to the start or end of the Rapid Access run.

5. Summary of Criteria for Access

1. Rapid Access mode is available for academic use only. Industrial users should contact the Industrial Liaison Office.
2. All proposals will be electronically refereed as soon as an application is received and slots are allocated on a first come basis.
3. All conditions for acceptance by users of beamtime are the same as for other access routes
4. Only low risk materials (as assessed by DLS safety group) are allowed.
5. All samples sent must be preloaded into capillaries and accompanied by a copy of the Experimental risk assessment (ERA).
6. An applicant* is entitled to submit a single proposal in three consecutive calendar months.
7. The maximum no. of samples per application is usually 5.
8. Research groups which already have beamtime in the current Allocation Period are not entitled to apply.

9. Samples will normally be disposed of after data collection (2 weeks). Samples can only be returned by prior special arrangement and will be the responsibility of the Applicant

* Eligibility as per DLS policy – see user office guidelines

6. Rapid Access Postal Address

All prepared samples must be packaged appropriately and send in advance to:

Dr. Julia Parker
Beamline I11 -Rapid Access Facility
Diamond Light Source
Harwell Science & Innovation Campus
Didcot
Oxfordshire OX11 0DE
United Kingdom

Full safety information must be enclosed with all samples.

All samples must arrive at DLS at least 7 days prior to the date of scheduled beamtime.

Applicants with proposals or requirements that lie outside of these guidelines are encouraged to contact I11 beamline staff to discuss other possible access routes.