

INSTRUMENT

BEAM LINE

11A

Fact Sheet



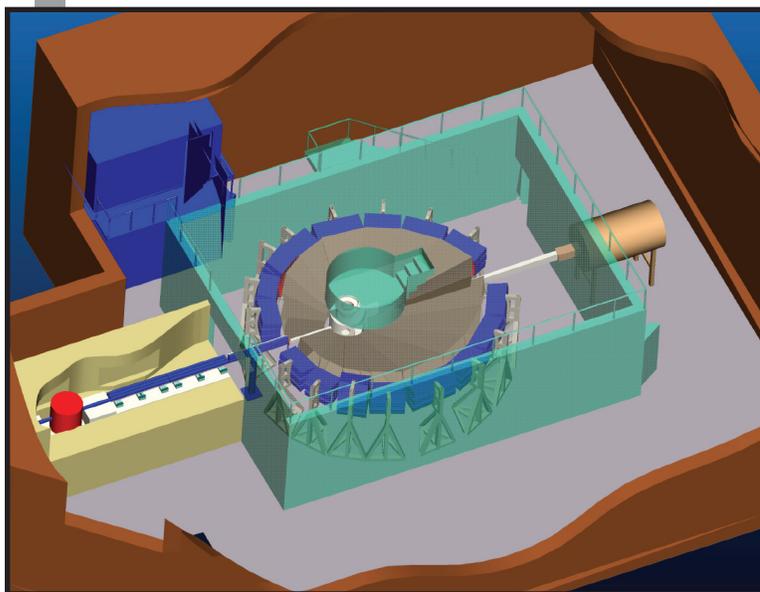
POWGEN3 POWDER DIFFRACTOMETER

SPECIFICATIONS

Moderator	decoupled poisoned supercritical hydrogen
Source-sample distance	60 m
Sample-detector distance	1 – 6 m
Detector angular coverage	$6^\circ < 2\theta < 170^\circ$
Wavelength bandwidth	$\sim 1 \text{ \AA}$
Frame 1	$0.3 \text{ \AA} < d < 10 \text{ \AA}$
Frame 6	$3 \text{ \AA} < d < 66 \text{ \AA}$
Resolution	$0.001 < \Delta d/d < 0.016$
Resolution at 90°	$\Delta d/d = 0.0015$

POWGEN3 will be an extremely flexible and versatile general-purpose diffractometer useful for a wide range of structural studies. It can cover d-spacings from $\sim 0.5 \text{ \AA}$ or less to well over 10 \AA in a single measurement and is capable of collecting typical Rietveld statistics in ~ 20 minutes from a 0.6 cm^3 sample with a $< 0.1\%$ resolution at short d-spacings and $< 1\%$ resolution for nearly all d-spacings of interest. Alternatively,

much of this resolution can be traded for intensity, making it possible to take measurements in $\ll 20$ minutes with still quite good resolution. The adjustable bandwidth-limiting choppers allow large variations in the incident wavelengths and pulse repetition rate. Insertable guide sections and the ability to trade resolution for intensity at the analysis stage allow users great latitude to optimize the data range, resolution, and statistical precision for each particular experiment.



RECENT SIGNIFICANT EVENTS

Instrument Construction

- All poured-in-place shielding has been installed.
- The main shutter and insert have been installed.
- The first 40 m of the supermirror neutron guide have arrived.
- Fabrication of the first two wavelength shifting crossed fiber scintillator detector modules has begun.
- Fabrication of the large T_0 chopper has been issued for bid.
- Fabrication of the beam line shielding blocks that comprise 48 m of the beam line has been issued for bid.
- The detailed finite-element analysis and design drawings for the complex sample vacuum vessel have been completed.

FOR MORE INFORMATION, CONTACT POWDER DIFFRACTOMETER STAFF

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www.sns.gov/users/instrument_systems/instruments/elastic/pow-gen3.shtml

