Measurement of: X-ray Diffractometer (XRD) measurements

Equipment: Powder X-ray Diffractometer (XRD)

Property Measured:
(i) Crystalline phase
(ii) Crystallite size, defects
(iii) Stress and strain
(iv) Preferred orientation
(v) Texture

Photograph (small size): Powder X-ray Diffractometer (XRD)

Basic Principle:

X-ray diffraction is now a common technique for the study of crystal structures and atomic spacing. The interaction of the incident X-rays with the sample produces constructive interference (diffracted ray) and satisfy the Bragg's Law ($n\lambda=2d \sin \theta$). These diffracted X-rays are then detected, processed and counted. By scanning the sample through a range of 2θ angles, all possible diffraction directions of the lattice is determined. Conversion of the diffraction peaks to d-spacings (2dhkl) allows identification of the material.

Capabilities:

Goniometer diameter	***185 mm***
Step scanning width	***2θ/-0.002 to 64^0/min (2θ)***
Sample stage	***Standard sample stage for flat and powder samples***
Monochromator	***Graphite***
Slit Assembly	***variable***
Alignment	***Automatic***
Radiation	***Cukα, line focus***
Watt.	***2 kW***

Sample Requirement: (a). films (max 1 cm x 1 cm) (b). Powder samples (min. 1 gm) (c) polymer (max 1 cm x 1 cm) (d) bulk (max 1 cm x 1 cm)