POLYCRYSTALLINE DIFFRACTION IN THE 1 MM SAMPLE SIZE RANGE USING A LOW-COST INTENSIFIED CCD CAMERA AND FOCUSINGOPTICS.

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Successful polycrystalline diffraction in the 1 mm range using a conventional powder diffractometer requires the use of a 2 D detector or a high sensitivity single point detector, focusing optics, and eucentric sample mounting.

The 2D detector is necessary to enhance sensitivity by detecting the whole Debye ring, and the focusing optic is needed to get enough primary beam intensity on to a small target area to produce measurable diffraction intensities.

Eucentric mounting of the sample allows for rotation of the sample to enhance averaging in the small spot size available.

A laser device is also necessary to illuminate the exact area of the surface of the sample which will be irradiated, and an optical microscope is necessary to see the features in the beam area.

The focusing primary beam optics can also be used with a conventional single point X-ray Detector , and a comparison of results is presented.