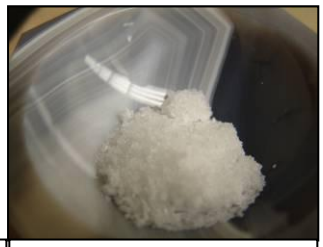
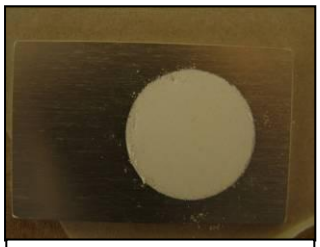
SHIMADZU XRD 6000 X-RAY DIFFRACTOMETER (XRD)

The Nanosciences and Biotechnology Core Facility (NBCF) at Tennessee State University houses Shimadzu XRD 6000. XRD – 6000 SHIMADZU is a mid-range powder X-ray diffractometer with Theta-2Theta system. It has three main uses (1) Determine the presence of a crystalline material; (2) Detect impurities in a sample; and (3) Determine the average size of a particle. The powder XRD has an optimal scanning range from an angle of 10 (deg) – 140 (deg). The Sample is crushed to a fine powder and packed into a aluminum holder. The sample is then placed in the XRD and through selecting various settings with a versatile software range of angles, time is controlled. The sample rotates at a speed of Theta while the detector rotates at a speed of 2*Theta.

Shimadzu XRD 6000

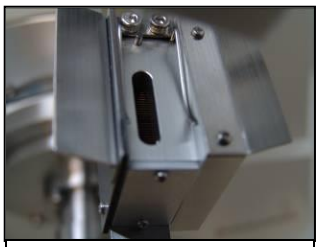


SrO2 Crystals

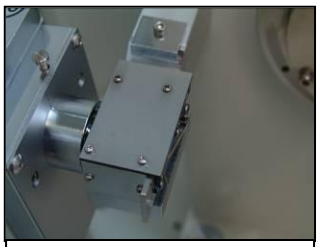


Fine powder SrO2

The source of X-Ray is Copper. The XRD scans are done with CuKα1 X-rays. In this machine the X-ray source is stationary and has two Soller slits. These provide unique advantages to an X-Ray scan, the stationary source significantly reduces systematic as well as calibration errors in the scan data. Also removes problems such as beam alignment from occurring. The two Soller slits limits the divergence of X-Rays in Rowland circle in vertical direction. This setting provides better data by minimizing errors and background noise.



Stoller slit 1



Stoller slit 2

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Nanosciences and Biotechnology Core Facility also has a Technician on duty who is available to assist or help prepare samples for scan. Current methods are being developed for solution based materials to be scanned by our powder XRD.