



<b>Experiment title:</b> High energy X-ray Compton Scattering studies of liquid and amorphous sulphur, selenium, and tellurium.	<b>Experiment number:</b> HE-569
<b>Beamline:</b> ID15B	<b>Date of experiment:</b> from: 20 <sup>th</sup> Feb 1999      to: 28 <sup>th</sup> Feb 1999
<b>Shifts:</b> 21	<b>Local contact(s):</b> Dr Thomas Buslaps
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**Report:**

Compton scattering is a technique that can be used to study the difference between the localised and delocalised electronic structure in a system. Tellurium , Selenium and Sulphur were studied as these underwent phase changes which change their electronic properties. Tellurium was studied to determine the electronic structure in the metallic state.

The samples were pure samples purchased from Aldrich and these were then placed into quartz tubes of 2mm diameter and sealed under vacuum. The sample were then measured on ID15B using an incident radiation 55.776 keV and a scattering angle of 173<sup>o</sup>, using a Ge 220 monochromator.

The sample was scanned at 298K for 24 hrs in order to achieve good statistics. The sample was then heated to ~450<sup>o</sup>C, just above melting , using the hot air furnace from BM16.

However, before data with a good S/N ratio could be measured the Insertion Device on ID15 failed and thus no further data could be collected.

Further experimentation is required to complete the experiment.

Analysis of the RT data is being carried out with comparison to the standard tabulated values. An example of the data collected at  $\sim 450^{\circ}\text{C}$  is shown in figure 1.

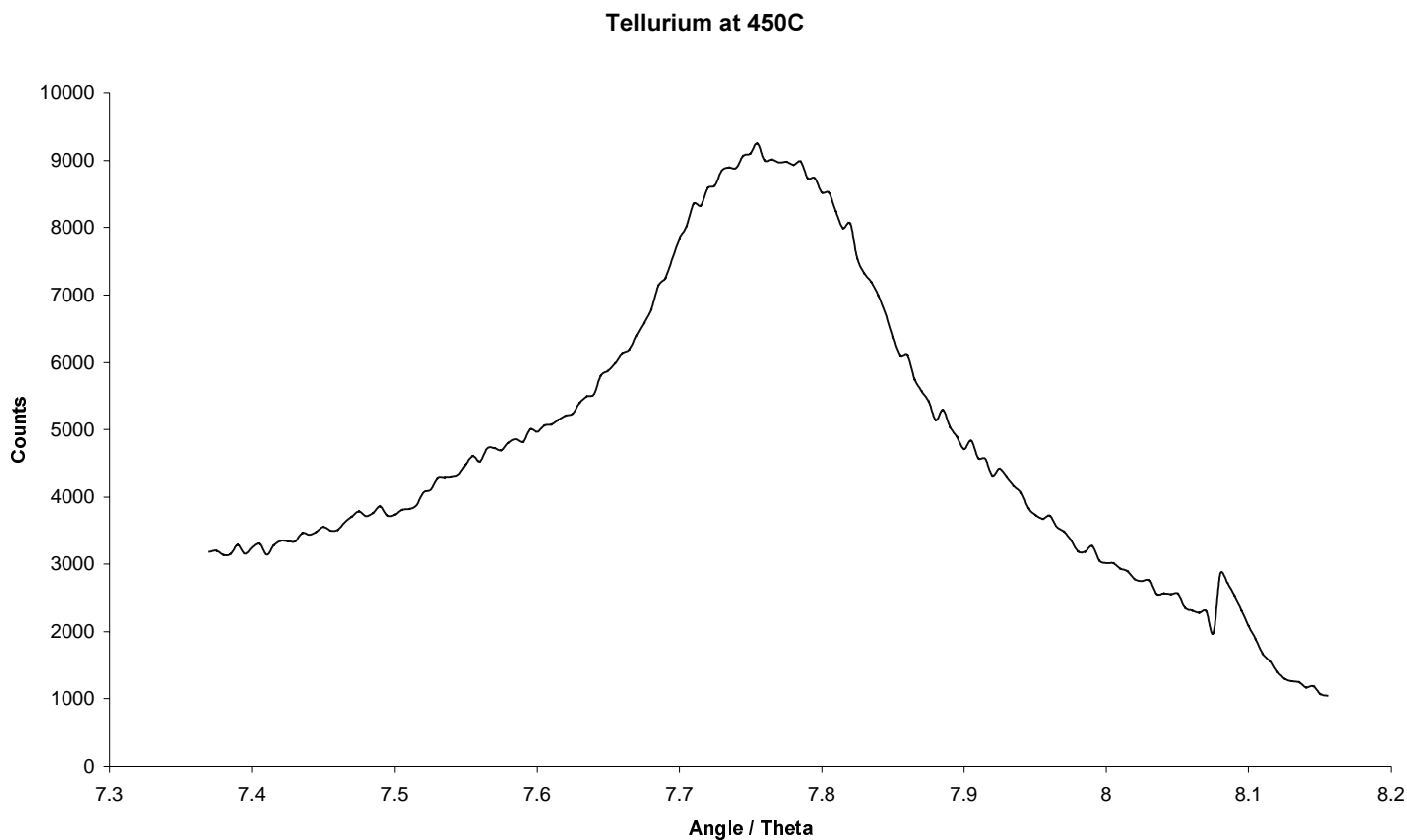


Figure 1 Experimental data recorded from Te at  $\sim 450^{\circ}\text{C}$ .