



ESRF	Experiment title: High Pressure x-ray powder diffraction study of the high Tc superconductor $\text{Hg}_2\text{Ba}_2(\text{Y}_{1-x}\text{Ca}_x)\text{Cu}_2\text{O}_{8-\delta}$	Experiment number: HS 131
Beamline: ID09	Date of experiment: from: 2/10/96 to: 6/10/96	Date of report: 14/2/97
Shifts: 12	Local contact(s): M. Hanfland	<i>Received at ESRF:</i>

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Report:

In 1996, we reported that title compound displayed a unusually high increase of Tc vs applied pressure among other superconducting cuprates. Furthermore, saturation of the Tc(p) curve was only obtained at $\approx 150\text{-}200$ kbar, below which the increase was practically linear. The aim of the present experiment was to investigate the evolution of the cell parameters and structural features at high pressure. The experiment was carried out on the ID09 beamline, in the angle dispersive geometry. The energy was $\approx 27\text{keV}$. Three samples with different Ca contents, yielding different Tc's, were used. The high pressure was obtained by using a diamond anvil cell, with silicon oil as pressure medium. The pressure was remotely controlled using the ruby fluorescence. Meaningful data were obtained up to 25 GPa. Debye rings were recorded on a A3 imaging plate. The patterns were corrected for spatial distortion, and the rings were averaged to yield intensity vs two-theta diagrams by using the Fit2D software developed by A. Hammersley at the ESRF. The data were then refined using the Rietveld technique. Preliminary results indicate that the relative decrease of cell parameters with increasing pressure is quasi isotropic, contrarily to the results obtained for the single layer mercury cuprates.