High-pressure X-ray diffraction study of TbN

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Preliminary experiments were performed on moisture sensitive terbium nitride (TbN) in a diamond anvil pressure cell up to 50 GPa at ambient temperature. Hydrostatic conditions were assured by adding silicon oil to the powder in the pressure cell. The experiments were carried out using the energy-dispersive diffraction method, with a fixed angle determined with a NaCl standard in the pressure cell.

The presence of a small oxide impurity phase, much softer than the nitride, gave inaccurate determinations of some peaks, thus forcing the number of quality peaks for unit cell determination down. Unfortunately it seems that the V versus p diagram has an s-shape, and it has not been possible to fit the data satisfactorily to an equation of state. No discontinuity indicating a transition to the Tb(IV) state was observed, neither was any phase transition.

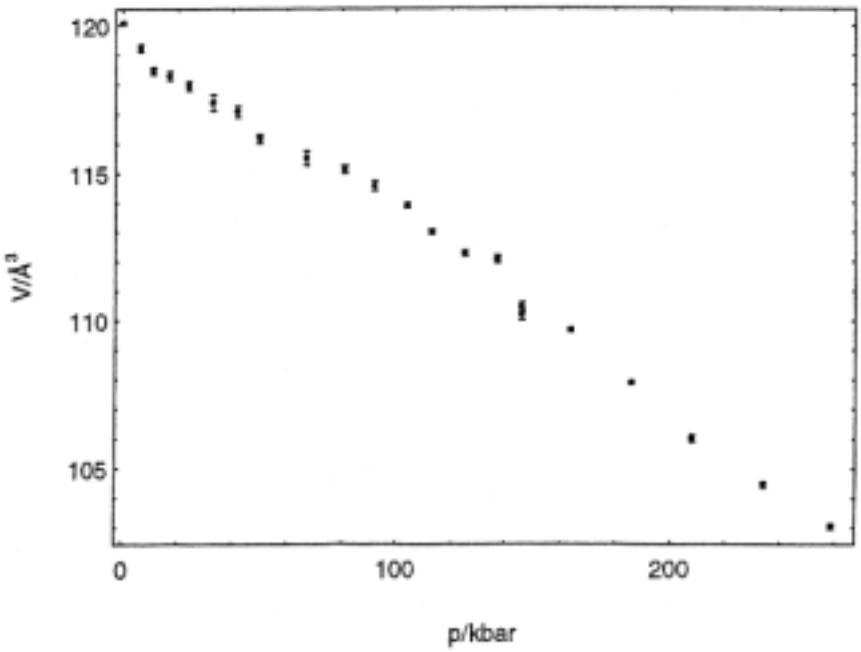

Figure 1: Compressibility curve of TbN.

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