be used to help determine the space group. The space group assignment was given using arguments from measurements on CsCN and a possible orientation entropy of R ln 2.[8]

Meaningful diffraction intensity measurements are possible with the high-pressure neutron diffraction apparatus[9] now at the CP-5 facility at Argonne. Such measurements could clarify many of the uncertainties in the understanding of these high pressure phases of KCN which were not cleared up by the x-ray studies. Thus we felt it of interest to measure the diffraction patterns of KCN III and KCN IV.[10] Our measurements confirm the structural description of KCN III but contradict the description of KCN IV suggested by previous high pressure x-ray work. KCN III is cubic with the space group Pm3m (O_h^1), while KCN IV is monoclinic with the space group Cm (C_s^3) rather than rhombohedral.

Measurements at different pressures and temperatures in phase IV yield a value of $\alpha = (.22 \pm .06) \times 10^{-3} {}^oC^{-1}$ for the volume thermal expansion and $\kappa = (1.43 \pm .33) \times 10^{-3}$ kbar^{-1} for the isothermal volume compressibility in this phase. The volume change between KCN III and KCN IV is $.38 \pm .07$ cm^3/mole at 22 kbar. This may be compared to Bridgman's value[1] of 0,22 cm^3/mole at 23 kbars from a piston-displacement measurement and Richter and Pistorius' value[6] of 0.49 cm^3/mole at 30 kbars from high pressure x-ray diffraction work. From our measurement and the slope of the III-IV phase line (.21 kbar deg^{-1}),[2] the entropy change between these two phases is calculated as R ln 2.62.

Although the measurement at 22 kbars and 66^{o}C appears to fall in the region previously reported as KCN III[2] we found that the KCN IV → III transition had not begun at this temperature and pressure, indicating a slight error in the previous determination