The pressure calibration was an important factor influencing the final design of the cell shown in Figure 3. Large pressure gradients over the temperature gradients inside the high pressure region would cause large uncertainties in the results. We originally started with a cell using talc as the pressure media, quite similar to that of Getting and Kennedy[2]. This would correspond to replacing the AgCl in our Figure 3 with talc. A wire of bismuth .03 cm diameter x .6 cm long was placed axially in the furnace from the seal to the top of the furnace. The bismuth 1 → 2 transition started at 32 Kb force/area on the compression stroke and took 7 Kb to complete. Using this design we found it impossible to go beyond the end of the bismuth 2 → 3 transition without danger of piston failure (44 Kb on the piston). If the bismuth wire extended the length of the cell the maximum pressure of the 1 → 2 transition should remain the same but the gradient would be extended from 7 Kb to 12 Kb. This would seriously compromise the determination of area in a p(T) vs T plot and thus the final results.

An improvement was noted by replacing .64 cm of the talc at the furnace end with AgCl. Here the bismuth 1 → 2 transition started at 28 Kb room pressure but still took 7 Kb to complete. The bismuth 2 → 3 transition was complete at 39 Kb on the piston. Another improvement was made by going to the configuration in Figure 3 except that the BN was .32 cm diameter. In this setup the 1 → 2 transition started at 27.5 Kb and took 6 Kb to complete. For the first time the bismuth 2 resistance had a flat portion. The bismuth 2 → 3 transition was complete at 36 Kb on the piston.