

Next many physically reasonable variations in the parameters n_i , N_i and E_i were tried thus altering the intercepts on the plot. It was found that either the (c/a) equilibrium equation (6) and the C_H equation (7) could be satisfied, or the (c/a) equilibrium equation (6) and the C_{66} equation (8) could be satisfied, but the C_H equation (7) and the C_{66} equation (8) could not be simultaneously satisfied with the required positive value of Z^2 .

From the above discussion one must conclude that a model more advanced than this one is necessary to interpret the elastic constants of cadmium. It is not unreasonable that the model used should break down for a high (c/a) ratio material like cadmium for one of the basic assumptions of the model is the rigid motion of small overlaps and holes with the Brillouin zone planes. A reciprocal space calculation comparing the free electron sphere to the Brillouin zone of cadmium estimates the number of overlap states (or the number of hole states) at approximately 14%.

Even though the B overlap is quite large, the approach used in this work might conceivably give a good estimate of the effect of this overlap. We believe in fact that the major difficulty is encountered in handling the motion of the holes.