COMPARISON WITH EXPERIMENTAL DATA ON COMPRESSION

Single-crystal acoustic data (i.e., the second-order elastic constants and their isothermal pressure derivatives) have been determined for three hexagonal crystals -- Mg [10], Cd [11], and CdS [12] and also for two trigonal crystals -- α-quartz [13] and corundum [14]. From these data, the adiabatic bulk modulus and its isothermal pressure derivative were calculated. Table 1 lists the initial density and volume of each crystal, adiabatic bulk modulus and its isothermal pressure derivatives evaluated at different boundary conditions, and percent elastic anisotropy in compression. These values of the isothermal pressure derivative of the adiabatic bulk modulus were then converted into (a) the isothermal pressure derivative of the isothermal bulk modulus and (b) the adiabatic pressure derivative of the adiabatic bulk modulus, according to the procedure presented earlier [6]. The results are summarized in Table 2.

Note that, for <u>small</u> elastic anisotropy, as in the cases of Mg and CdS, $\{B_1^T\}_{p=0}$ and $\{B^{*T}\}_{p=0}$ are practically the same; their pressure derivatives are identical. The consequence of this equality is that, for these materials, the compression curves as calculated from the ultrasonic data on single-crystals are expected to be identical with those of the corresponding pore-free polycrystalline materials. An illustration of this can be made for Mg as follows: The <u>ultrasonic</u>