compression curves are the experimental data on isothermal compression [31, 32] as well as on shock-wave compression [33, 34]. Up to about 150 kb, the compression curves drawn from the Murnaghan equation are in reasonably good agreement with the experimental data. Above 150 kb, the shock-wave compression points [33, 34] deviate sharply from the compression curves of α-quartz, and this deviation is associated with phase transformations of α-quartz to denser polymorphs.

The compression of both single-crystal and polycrystalline corundum is illustrated in Fig. 4 (see also Refs. 5 and 38). The experimental compression points include those of Bridgman [35] and Hart et al [36] measured on single-crystals. Also included are the shock-wave data [37] on both single-crystal and polycrystalline materials. The lines in the figure represent the Murnaghan equation of state calculated from the acoustic parameters: one derived from the single-crystal acoustic data [14] and the other from the polycrystalline acoustic data [38]. It is apparent that the Murnaghan parameters evaluated from both single-crystal and polycrystalline acoustic data yield a good description of the pressure-volume relation for the experimental compression points including the shock-wave data.