Experimentally, the Murnaghan parameters B_0 and B_0' can be determined accurately from ultrasonic measurements made either on single-crystals or on pore-free polycrystalline aggregates [5, 6]. It is expected theoretically that, for solids of isotropic and cubic symmetries, the Murnaghan parameters determined on single-crystals are exactly the same as that measured on the corresponding pore-free polycrystalline aggregates. However, for solids of lower symmetry, the bulk modulus calculated from the single-crystal second-order elastic constants differs from the corresponding modulus measured on pore-free polycrystalline aggregates; the difference between the two values is proportional to the elastic anisotropy of the crystal. The question thus arises as to the relation between the Murnaghan parameters determined on polycrystalline materials and those obtained from single-crystals. Our purpose in this communication is to suggest the appropriate Murnaghan parameters for anisotropic non-cubic solids and to examine the extent to which the usual application of linear elasticity theory is still useful for predicting the pressure-volume relation of strongly anisotropic crystals.