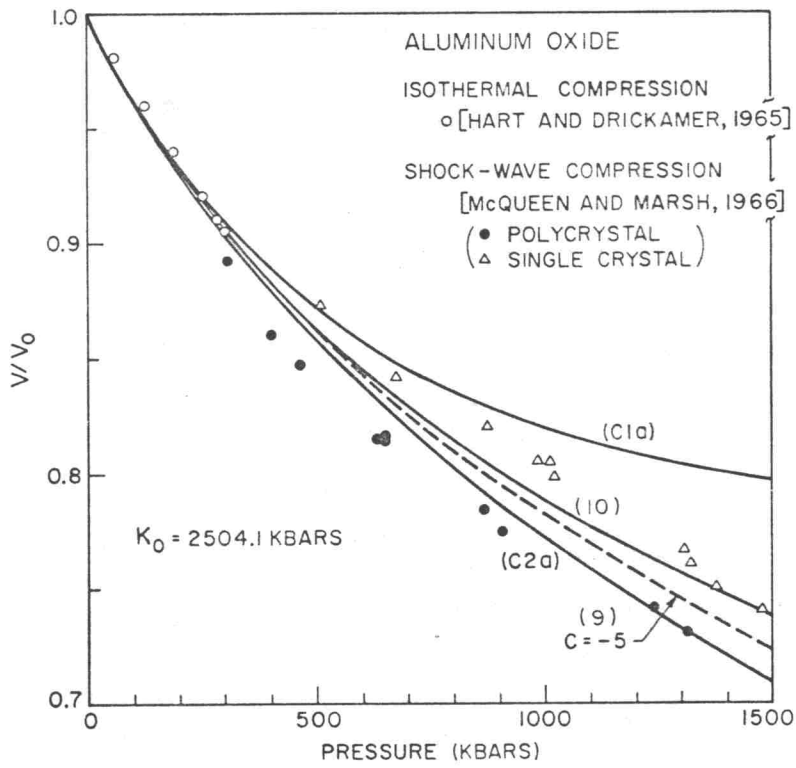

Fig. 2.

Figures 2–7 give a comparison of extrapolated and measured values of volume ratio v/v_0 versus pressure for aluminum oxide, α-quartz, magnesium, potassium, sodium, and lead; the curves are marked with the numbers of the extrapolation formulas given in the text.

where $q = (1 + A + am)^2 - 4am$.

For the case $C = K_0K_0'' = 0$, the integration of the expression for the bulk modulus (equation 7 with $A = 0$ and $m = K_0'$) leads to the 'extrapolation formula' for V due to *Murnaghan* [1944]

$$V = [1 + K_0'P]^{-1/K_0'} \qquad (10)$$

Results of Calculations

The results of the calculations based upon equations 9 and 10 for aluminum oxide, α-quartz, magnesium, potassium, sodium, and lead are compared with experimental data in Figures 2–7. In these figures the solid curve is a plot of equation 10, whereas the dashed curve refers to equation 9. The additional solid curves, labeled C1a and C2a, are derived from the exponential formulas discussed in Appendix C.

The calculations were based on values of K_0 and K_0' compiled by *Anderson* [1966]. These are listed in Table 1. For equation 9, $m = 5/3$ was chosen for $C < 0$, whereas for $C > 0$ the approximation given by equation 4 was used to determine m; the value of K_0'' was chosen (by trial and error) to provide reasonable agreement with the experimental compression data. The sources of the data are cited in the figures.

An error in K_0' will clearly affect the apparent value of K_0'' needed for a good fit. For this reason, it is important to have a reliable value of K_0' before any confidence can be placed in an estimate of K_0''. For example, a relatively small error in K_0' may very well account for the unexpected difference (in sign of K_0'') between sodium and potassium. Similarly, taking account of a possible difference in K_0' between monocrystalline and polycrystalline aluminum oxide would be very likely to affect the conclusions concerning C.

For aluminum oxide, α-quartz, and magnesium (Figures 2–4), the disparity between the ex-