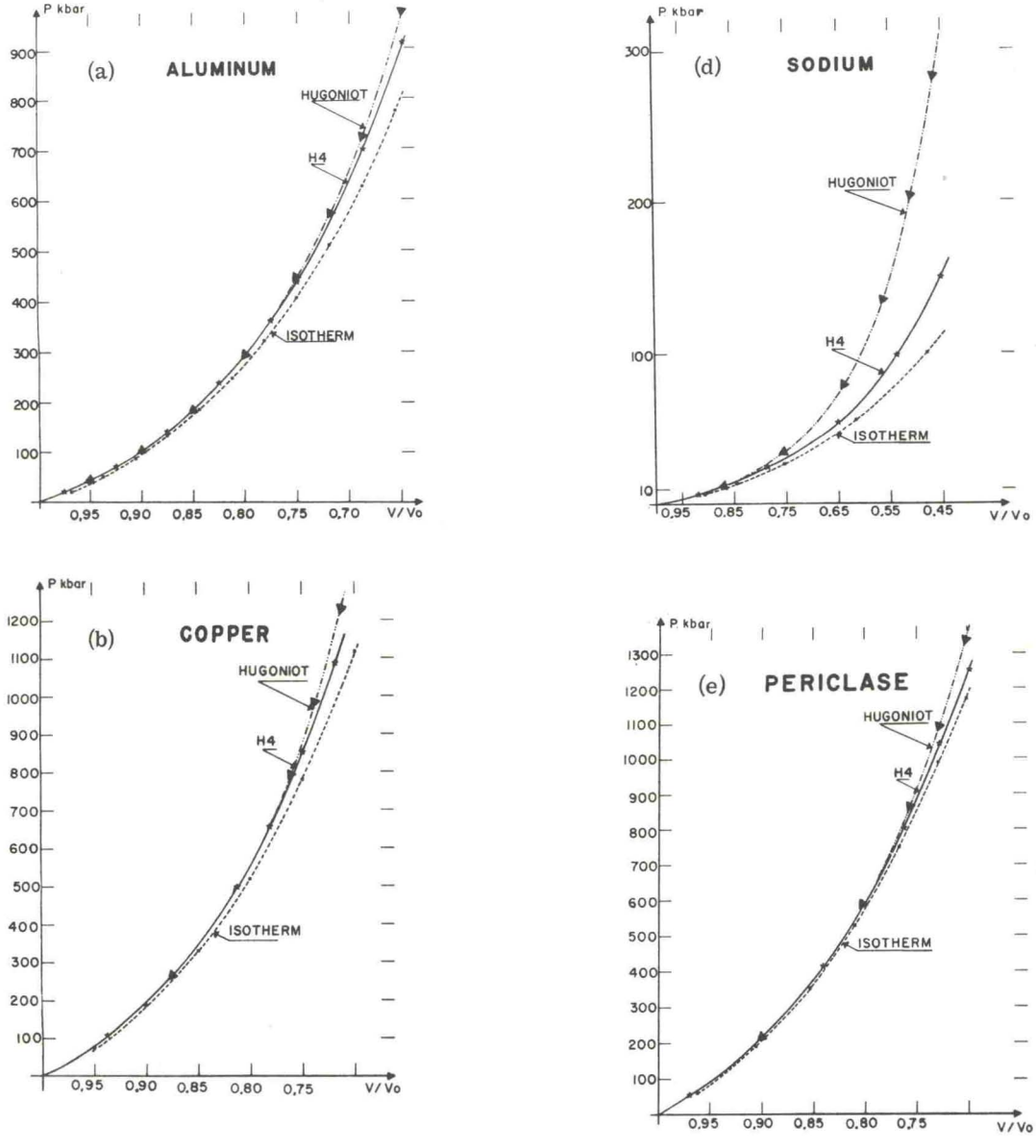

FIG. 1. Comparison of the calculated fourth-order curves (H_4) with the experimental Hugoniot curves for (a) aluminum, (b) copper, (c) silver, (d) sodium, and (e) periclase. The isotherms calculated from Eq. (9) are also shown for $T = 300\,^{\circ}\mathrm{K}$.

It should be noted that determination of the temperature using Eqs. (15) and (16) is justified only in the range of the close fit of the curves. Nevertheless, this method has been applied for $V_H/V_0 = 0.8$ or 0.775 as the case may be, to obtain an order of magnitude of the temperature beyond the range of validity of our assumption. In the range of close fit of the curves our results are in good agreement with those of Rice, McQueen, and Walsh[6] for aluminum, and those of McQueen and Marsh[9] for

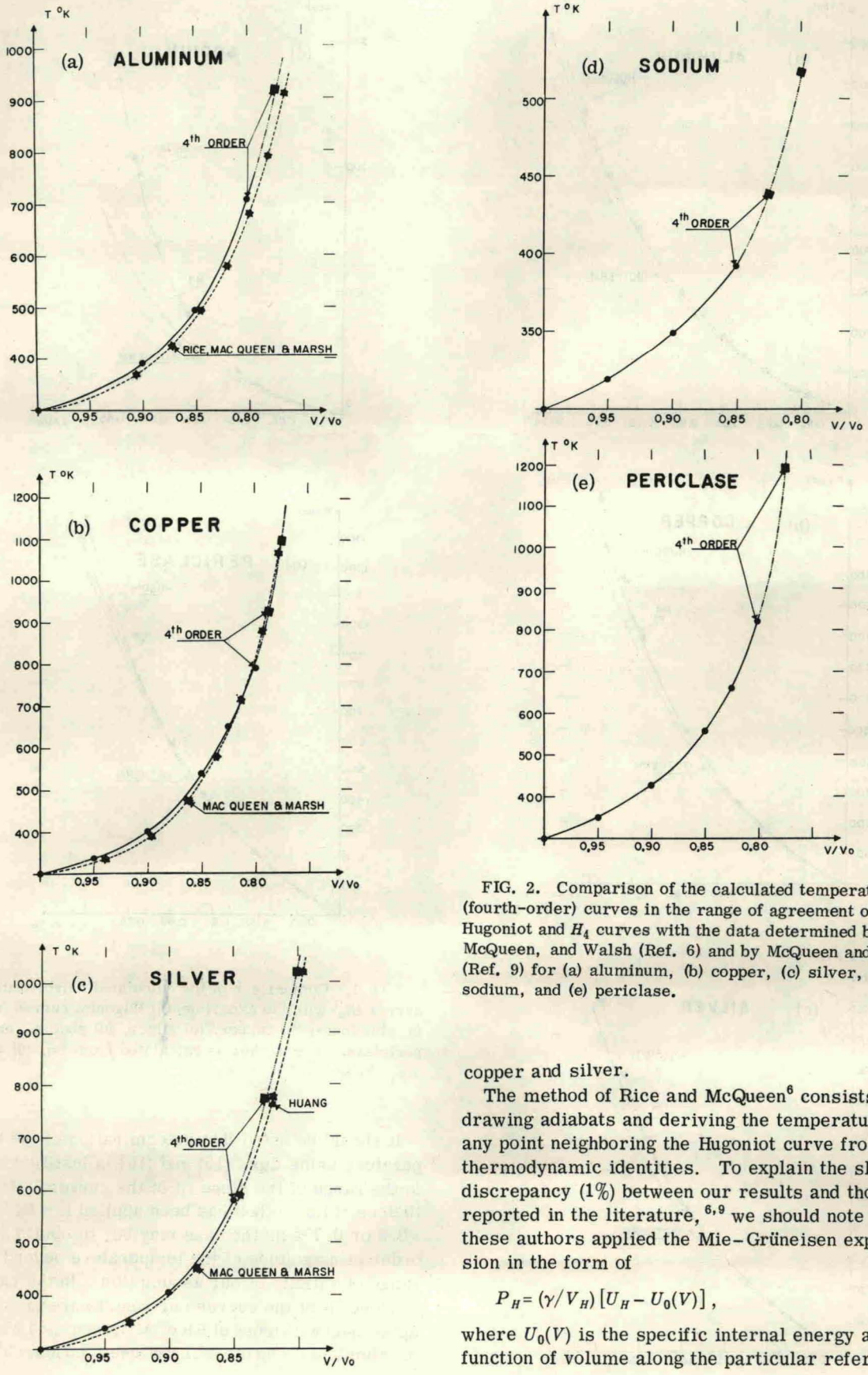

FIG. 2. Comparison of the calculated temperature (fourth-order) curves in the range of agreement of the Hugoniot and H_4 curves with the data determined by Rice, McQueen, and Walsh (Ref. 6) and by McQueen and Marsh (Ref. 9) for (a) aluminum, (b) copper, (c) silver, (d) sodium, and (e) periclase.

copper and silver.

The method of Rice and McQueen[6] consists of drawing adiabats and deriving the temperature at any point neighboring the Hugoniot curve from thermodynamic identities. To explain the slight discrepancy (1%) between our results and those reported in the literature,[6,9] we should note that these authors applied the Mie–Grüneisen expression in the form of

$$P_H = (\gamma/V_H)\,[U_H - U_0(V)]\,, \tag{18}$$

where $U_0(V)$ is the specific internal energy as a function of volume along the particular reference