calculating Γ. However, since the low temperature region is eliminated, the assumption Γ/v = constant may be a reasonable one. Then Eq. (2.4) becomes

$$p = p_i + b\,(E-E_i) \tag{2.5}$$

$$E_H = E_o + \tfrac{1}{2}\,p_H\,(v_o-v) \tag{2.6}$$

$$\begin{aligned} dE_i &= (T_o\,(\partial p/\partial T)v - p_i)dv \\ &= (bC_vT_o - p_i)dv \end{aligned} \tag{2.7}$$

where $b = \Gamma/v$ = constant, C_v = constant, $p_i(v)$ and $E_i(v)$ are pressure and internal energy, respectively, on the T_o isotherm, and subscript "H" refers to the Hugoniot curve. Setting p and E in Eq. (2.5) equal to p_H and E_H and combining with Eqs. (2.6) and (2.7) yields a differential equation for p_i:

$$\begin{aligned} (dp_i/dv) + bp_i &= (1 - b(v_o-v)/2)(dp_H/dv) \\ &\quad + bp_H/2 + b^2C_vT_o \end{aligned} \tag{2.8}$$

The solution of this equation is

$$p_i(v) = A\exp(-bv) + bC_vT_oB \tag{2.9}$$

$$A = f(v) - b\int_{v_o}^{v} f(v)\,dv$$

$$B = 1 - \exp(b(v_o-v))$$

$$f(v) = (1 - (b/2)(v_o-v))\,p_H\exp(bv).$$

Experience has shown that Hugoniot data for liquids and solids can be fitted quite well by curves of the form

$$p_h(v) \;=\; \sum_{n=1}^{3} a_n x^n \qquad (2.10)$$

where $x \;=\; \rho v_o - 1$.

Equations of the form (2.10) have been fitted to shock data on liquids and used to calculate $p_i(v)$ and $E_i(v)$ from Eqs. (2.9) and (2.7), respectively. The numerical results are used in a least squares procedure to calculate the coefficients b_n in the equation for isothermal pressure:

$$p_i \;=\; \sum_{n=1}^{3} b_n x^n$$

where $x = \rho v_o - 1$ as in Eq. (2.10). The coefficients a_n and b_n are given in Table I.