Values of f(v) in the specific volume range $0.994 < v < 1.35$ cc/g along the atmospheric isobar were calculated with the identity,

$$f(v) = - C_p \left(\frac{\partial v}{\partial p}\right)_s \left(\frac{\partial T}{\partial v}\right)_p \tag{16}$$

The values of C_p and $(\partial v/\partial T)_p$ were determined experimentally. The values of $(\partial p/\partial v)_s$ were calculated from the sound velocity data of McSkimin[10], which were extrapolated to cover the range of initial temperatures used in the shock experiments. Values of f(v) in the volume range $0.515 < v < 0.55$ cc/g were taken to be the slopes of (e-p) isochores calculated from the Hugoniot curves. Values of f(v) in the intermediate range were assumed to lie on a smooth curve because values of $(\partial e/\partial p)_v$ calculated in the neighborhood of 0.54 cc/g were approximately equal to the value calculated at 0.994 cc/g. Least squares fits of the data give the following expressions for f(v):

$$f(v) = -23.055 + 23.134v \qquad \text{if } v \geq 1.152 \text{ cc/g}$$

$$f(v) = 60.502 - 121.866v + 62.916v^2 \qquad \text{if } 0.9693 \leq v \leq 1.152 \text{ cc/g}$$

$$f(v) = 1.3822 + 0.108v \qquad \text{if } v \leq 0.9693 \text{ cc/g}$$

where the constants are given to a number of decimal places for computation.

Since h = e = g(v) when p = 0, the measured enthalpies at atmospheric pressure give values of g(v) in the volume range $0.985 \leq v \leq 1.66$ cc/g. A linear least squares fit for g(v) in this volume range is given by the expression

$$g(v) = -16.107 + 15.517v.$$

For values of volume less than 0 985 cc/g, fits for g(v) were generated by patching together the high pressure Hugoniot data and the atmospheric data so as to satisfy the condition $dg/dv > 0$. The best least squares fits for g(v) with a slight discontinuity in the slope at v = 1.01316 cc/g are:

$$g(v) = 2408.116 + 7566.432v - 7949.11v^2 + 2787.845v^3$$
$$\text{if } v \leq 1.0136 \text{ cc/g}$$

$$g(v) = -16.107 + 15.517v \qquad \text{if } v \geq 1.0136 \text{ cc/g}$$