(100) and (111) orientations.

Both linear and quadratic terms in u_p were used to fit these data. In the absence of other information, there would be no point in going to an order higher than linear to fit the data; however, consideration must be given to the measured sound speeds in NaCl. In fact, the c_0 coefficient in our quadratic fit was forced to agree with the sound speed obtained from Haussuhl's[14] measurement of the elastic constants of single crystal NaCl. The least squares analysis of the data gives r.m.s. deviation of $\Delta u_s = \pm 0.056$ km/sec or less over the range of the data. Within the range of the data, the quadratic and linear fits agree to within this Δu_s except for the lowest four data points. The low shock pressures for these four points (< 40 kb) were produced by relatively complicated driver arrangements that depend on impedance mismatches. It is not impossible that overtaking waves could influence these measurements. The shock velocities at these pressures are notably below some of the single crystal longitudinal velocities. Premature closure of flash gaps could give rise to the sort of discrepancy we see here, but since a low-pressure cannon shot has indicated that the Hugoniot elastic limit of NaCl is only about 2/3 of a kilobar, there is not sufficient motion imparted to a shim to close any flash gaps used here. Gap closure corrections are more critical in this pressure regime and conceivably could cause errors in shock wave velocity, but not of the size to explain these low pressure shots. In any event, forcing the Hugoniot through the sound speed prevents these points from appreciably influencing the fit to the data. The large bulk of the data at higher pressure with its linearity fixes the next two terms of the series. Some evidence that these lower points influence the slope in the right direction is afforded by Bartels and Schuele's[15] measurement of $(\partial B_S/\partial P)_T = 5.27$.

From the thermodynamic identities

$$s_0 = [1 + (\partial B_S/\partial P)_S]/4$$

and

$$(\partial B_S/\partial P)_S = (\partial B_S/\partial P)_T + \gamma\,(T/B_S)\,(\partial B_S/\partial T)_P$$

and Haussuhl's[14] value for $(\partial B_S/\partial T)_P$ of -0.000117 Mb/°K, we obtain $s_0 = 1.513$. This is in satisfactory agreement with our fitted slope of 1.542. Although a linear fit represents the shock-wave data adequately, emphasis should be placed on the ultrasonic measurements in the low pressure region. The quadratic fit

$$u_s = 3.403 + 1.5422\,u_p - 0.07345\,u_p^2 \quad \text{(km/sec)} \qquad (1)$$

represents the ultrasonic data in the low pressure region and the shock-wave data in the high pressure region. The number of significant figures quoted in the above equation gives the exact form of the Hugoniot used in a subsequent reduction to an isotherm. The r.m.s. spread in u_s about the fitted values is ±0.05 km/sec. Our data for NaCl in the B1 phase are in agreement with the data of Larson, et. al[3], to within the quoted error. Unpublished data of Hauver and Melani[16] are in