TABLE V. Adiabatic and isothermal elastic constants (in units of 10^{11} dyn/cm^2) and the parameters Δ and λ of RbCl as a function of pressure (in units of kilobars) at 304°K.

Pressure	C_{11}^S	C_{11}^T	C_{12}^S	C_{12}^T	C_{44}	B^S	B^T	Δ	λ
0.001	3.609	3.524	0.620	0.537	0.466	1.618	1.533	0.0557	1.00000
0.295	3.644	3.560	0.625	0.542	0.465	1.633	1.548	0.0549	1.00064
0.575	3.683	3.599	0.629	0.545	0.463	1.648	1.563	0.0541	1.00124
0.975	3.741	3.657	0.633	0.546	0.461	1.670	1.586	0.0529	1.00209
1.500	3.817	3.733	0.643	0.559	0.457	1.700	1.617	0.0515	1.00318
2.030	3.887	3.805	0.655	0.566	0.454	1.728	1.646	0.0500	1.00427
2.490	3.953	3.871	0.661	0.574	0.451	1.755	1.673	0.0486	1.00520
2.995	4.018	3.938	0.646	0.581	0.448	1.781	1.700	0.0472	1.00620
3.525	4.088	4.009	0.680	0.592	0.445	1.810	1.731	0.0457	1.00723

pertain. Lastly, we present calculations of the Cauchy and anisotropy relations based on the values of the elastic constants of the three rubidium halides.

RUBIDIUM CHLORIDE

The temperature dependence of the elastic constants of rubidium chloride at one atmosphere has been investigated by Marshall *et al.*[9] from 4.2° to 300°K, and by Haussühl[10] at high temperatures. We report the variation in the elastic constants as a function of temperature as obtained in the present work and in Ref. 9 (see Table III).

In the calculation of the elastic constants of rubidium chloride a density value of 2.7969 g/cm^3 at 300°K is used. The linear thermal expansion coefficient at 293°K is given as $\alpha=38.13\times10^{-6}(°K)^{-1}$ with no temperature variation over the range of 20 to 193°C.[11] The values of $\beta(T)$ at lower temperatures are estimated by using the Grüneisen relationship in conjunction with the experimentally determined values of the specific heat at low temperatures.[12] The values of density are included in Table III to show that the use of the specific-heat curve modeled after that of the other alkali halides[13] by Marshall *et al.*[9] and the use of the experimental values of the specific heat by us to compute the temperature dependence of the thermal expansion at low temperatures yield very nearly the same values for density at each temperature. Hence, any difference in the temperature dependence of the elastic constants as obtained in the above two investigations must be caused by something other than the difference in procedure to estimate the thermal expansion of rubidium chloride at low temperatures. Table III shows that the close agreement between the values of C_{11} and C_{44} as a function of temperature obtained in these two investigations is lacking with respect to C_{12}. Whereas the values of C_{12} reported by Marshall *et al.*[9] increase with a decrease in temperature and remain unchanged below 200°K, our values of C_{12} decrease with a decrease in temperature and show no sign of levelling off to 100°K. We have no satisfactory explanation for the disagreement in the values of C_{12} as indicated above. However, there is some inferential support for the implausibility of the results reported by Marshall *et al.*[9]: (1) the contention of Marshall *et al.* that their results are consistent with the temperature dependence of C_{12} of alkali halides with NaCl structure does not hold, for the behaviors of the C_{12} of alkali halides with NaCl structure are more like that which we report for RbCl; (2) even though the

TABLE VI. Adiabatic and isothermal elastic constants (in units of 10^{11} dyn/cm^2) and the parameters Δ and λ of RbCl as a function of pressure in units of kilobars at 259°K.

Pressure	C_{11}^S	C_{11}^T	C_{12}^S	C_{12}^T	C_{44}	B^S	B^T	Δ	λ
0.001	3.749	3.674	0.609	0.533	0.471	1.654	1.580	0.0469	1.00000
0.320	3.792	3.718	0.612	0.536	0.469	1.671	1.597	0.0462	1.00067
0.602	3.830	3.756	0.616	0.541	0.468	1.686	1.613	0.0456	1.00126
0.998	3.887	3.814	0.623	0.544	0.465	1.707	1.634	0.0447	1.00207
1.515	3.958	3.885	0.628	0.555	0.462	1.737	1.665	0.0435	1.00312
1.995	4.023	3.951	0.637	0.562	0.459	1.764	1.692	0.0425	1.00408
2.485	4.089	4.018	0.643	0.569	0.456	1.790	1.719	0.0414	1.00504
3.015	4.158	4.088	0.648	0.578	0.452	1.818	1.748	0.0402	1.00606
3.540	4.229	4.160	0.659	0.585	0.450	1.846	1.777	0.0390	1.00706
4.035	4.291	4.223	0.671	0.593	0.446	1.872	1.803	0.0380	1.00799

TABLE VII. Adiabatic and isothermal elastic constants (in units of 10^{11} dyn/cm^2) and the parameters Δ and λ of RbCl as a function of pressure in units of kilobars at 222°K.

Pressure	C_{11}^S	C_{11}^T	C_{12}^S	C_{12}^T	C_{44}	B^S	B^T	Δ	λ
0.001	3.869	3.804	0.594	0.528	0.475	1.686	1.620	0.0406	1.00000
0.325	3.912	3.847	0.597	0.532	0.473	1.702	1.637	0.0400	1.00066
0.690	3.963	3.898	0.602	0.536	0.471	1.722	1.657	0.0394	1.00140
1.010	4.010	3.945	0.606	0.541	0.469	1.741	1.676	0.0388	1.00205
1.490	4.077	4.013	0.613	0.548	0.466	1.768	1.703	0.0379	1.00300
2.015	4.146	4.082	0.620	0.557	0.462	1.796	1.732	0.0370	1.00402
2.515	4.216	4.152	0.626	0.562	0.459	1.822	1.759	0.0361	1.00498
3.035	4.284	4.221	0.634	0.571	0.456	1.850	1.788	0.0351	1.00596
3.530	4.350	4.288	0.639	0.577	0.453	1.876	1.814	0.0342	1.00688

TABLE VIII. Adiabatic and isothermal elastic constants (in units of 10^{11} dyn/cm^2) and the parameters Δ and λ of RbCl as a function of pressure (in units of kilobars) at 181°K.

Pressure	C_{11}^S	C_{11}^T	C_{12}^S	C_{12}^T	C_{44}	B^S	B^T	Δ	λ
0.001	4.001	3.946	0.575	0.520	0.479	1.717	1.662	0.0333	1.00000
0.350	4.048	3.993	0.579	0.523	0.477	1.735	1.680	0.0328	1.00070
0.695	4.096	4.041	0.585	0.529	0.475	1.755	1.700	0.0323	1.00138
0.982	4.137	4.082	0.589	0.534	0.473	1.772	1.717	0.0319	1.00194
1.326	4.186	4.132	0.592	0.538	0.471	1.790	1.736	0.0314	1.00261
1.730	4.240	4.185	0.598	0.544	0.468	1.812	1.758	0.0309	1.00338
2.02	4.280	4.226	0.602	0.548	0.466	1.828	1.774	0.0305	1.00393
2.49	4.346	4.293	0.607	0.553	0.464	1.854	1.800	0.0298	1.00481

TABLE IX. Adiabatic elastic constants (in units of 10^{11} dyn/cm^2) and parameter Δ and density (in units of g/cm^3) of RbBr as a function of temperature (°K) as obtained in the present work (PW) and those obtained by Lewis, Lehoczky and Briscoe (LLB).

	C_{11}		C_{12}		C_{44}		Bulk modulus		Density		
Temp.	PW	LLB	PW	LLB	PW	LLB	PW	LLB	PW	LLB	Δ
	±0.16%		±0.2%		±0.16%						
300	3.152	3.107	0.5000	0.515	0.3801	0.3760	1.384		3.350	3.349	0.0496
280	3.204	3.164	0.494		0.382		1.397		3.357	3.356	0.0456
260	3.262	3.220	0.486		0.383		1.412		3.364	3.363	0.0415
240	3.317	3.276	0.480		0.385		1.426		3.371	3.370	0.0376
220	3.373	3.334	0.473		0.387		1.440		3.378	3.377	0.0337
200	3.430	3.390	0.465		0.388		1.453		3.385	3.384	0.0297
180	3.488	3.446	0.459		0.390		1.469		3.392	3.391	0.0259
160	3.542	3.503	0.451		0.391		1.481		3.398	3.398	0.0227
140	3.597	3.559	0.444		0.393		1.495		3.404	3.404	0.0193
120											
100											
80		3.725		0.474		0.4050				3.424	
60		3.775		0.474		0.4068				3.428	
40		3.820		0.474		0.4076				3.432	
20		3.853		0.474		0.483				3.434	
10		3.860		0.474		0.4085				3.434	
4		3.863		0.474		0.4085				3.434	