Table 1. *X-ray data*

I	q_o	q_c	*hkl*	*I*	q_o	q_c	*hkl*	*I*	q_o	q_c	*hkl*	*I*	q_o	q_c	*hkl*
m	139	140	101	*m*	858	858	107	*w*	1741	1742	$3\bar{2}3$	*m*	2229	2223	$3\bar{3}0$
s	238	239	004	*Bvvw*	1036	1037	206	*w*	1760	1747	1,1,10			2235	404
w	259	260	103	*w*	1224	1227	$2\bar{2}4$	*Bw*	1771	1772	323	*s*	2326	2328	332
s	307	307	$1\bar{1}2$							1778	$3\bar{1}6$	*vw*	2490	2485	$4\bar{1}5$
s	312	312	112	*w*	1255	1258	303	*w*	1788	1793	316	*m*	2529	2534	406
vs	500	499	200	*w*	1303	1300	$3\bar{1}2$	*w*	1856	1856	307	*w*	2545	2535	$4\bar{2}2$
		499	105	*w*	1310	1315	312	*m*	1896	—	—	*m*	2569	2575	422
vs	560	559	202	*w*	1337	1336	109	*w*	1914	—	—	*vw*	2740	2734	$3,\bar{1},10$
s	635	634	$2\bar{1}1$	*m*	1357	1354	$2\bar{1}7$	*w*	1947	1945	$2\bar{2}8$	*m*	2767	2761	$3\bar{3}6$
s	643	644	211					*vw*	1964	1965	228	*w*	2853	2848	329
s	758	754	$2\bar{1}3$	*Bvw*	1459	1456	208	*w*	2000	1996	400	*w*	2944	2953	408
s	761	764	213	*vw*	1491	1494	314	*vvw*	2031	—	—	*vw*	2991	—	—
m	783	785	$1\bar{1}6$	*m*	1622	1622	$3\bar{2}1$	*m*	2109	—	—	*vvw*	3076	—	—
				m	1652	1652	321	*w*	2158	2153	0,0,12	*w*	3165	3164	431

with a unit cell ($a' = 9{\cdot}70$ Å, $b' = 9{\cdot}80$ Å, $c' = c$) twice as large as the body-centered monoclinic unit cell which is used here. Since the former can accommodate 32 asymmetric units, the value $Z = 16$ for the latter involves no anomalies.

(*c*) In the body-centered description, the indices of all indexable lines follow the rather severe special restrictions of the space-group $I4_1/amd$. Below $q = 1800$, for instance, these restrictions account for 19 of the 31 absent indices triplets on a total of 58 available triplets in the same range. This suggests that pseudo-tetragonal symmetry applies not only to the lattice, but to the structure as well, in accordance with the equal intensities of $h\bar{k}l$ and hkl in the 'split lines'.

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Corrected values of elastic constants of sapphire.

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(*Received* 5 *October* 1960)

In a recent paper Mayer & Hiedemann (1959) described various ultrasonic methods for the determination of the elastic constants of transparent single crystals. These methods were applied to ultrasonic velocity measurements in various crystallographic directions in sapphire. From the measured velocities and from the orientations supplied by the manufacturer of the samples, the six elastic constants of sapphire were calculated. More recently Wachtman *et al.* (1960) reported the values of the elastic moduli of synthetic sapphire. A comparison between their data and the results obtained by the authors showed some discrepancies which indicated that the actual orientations of some of the samples could have been different from those communicated to us by the manufacturer. A subsequent redetermination of the crystallographic orientations, performed by the National Bureau of Standards, showed this was the case for one sample.

The velocity measurements taken previously by the authors can now be interpreted on the basis of the corrected orientation of the samples. The exact Christoffel equations are used to calculate a new set of elastic constants of synthetic sapphire. The evaluating procedure given in the earlier paper is in principle incorrect and should, therefore, not be used, although it leads to practically the same values of C_{pq} in the case of sapphire. Table 1 lists the corrected values together with the average values given by Wachtman *et al.* (1960).

Table 1. *Elastic constants of synthetic sapphire*

In units of 10^{12} dyne/cm.^{2}.

C_{pq}	Wachtman *et al.*	Present work
C_{11}	4·968	4·96
C_{33}	4·981	5·02
C_{44}	1·474	1·41
C_{12}	1·636	1·35
C_{13}	1·109	1·17
C_{14}	−0·235	−0·23

The authors wish to thank J. B. Wachtman Jr. and D. G. Lam Jr. of the National Bureau of Standards for helpful discussions and for redetermining the orientation of the samples.

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