d closely to proin certain shear curves ¹⁰).

al plates and six relative to the tudy. The prepad orientations of e samples ranged am with lateral

nge in ultrasonic re for each of the propagate in each ions was carried urison technique tion is as follows:

$$\frac{v_0/2\pi}{v/2\pi}$$
,

(1)

to be determined ive to a reference sured at 298° K. prresponds to nnple thickness of K. Disregarding ckets, V at any btained from a ling to the same were present at of t, the specimen e, using existing uantity in square nge in the phase $\gamma/2\pi$ being the account for the ng material. The escribed by Mceasurements this view of the very rom the relative ve trains.

2.3. MEASURING APPARATUS

With exception for the coupling cement, the apparatus used for the measurements was precisely the same as described in ¹⁰) for measurements above 300° K. The sample was separated vertically from the piezoelectric transducer by a 20 to 25 mm long fused silica buffer rod. A very thin layer of phenolic resin paste, described in ¹²), was used to couple the sample acoustically to the buffer rod. Contrary to the information given in ¹²), the present experiments have shown that this cement can propagate both longitudinal and transverse waves up to temperatures of 923° to 933° K.

The measurements of f_n were carried out in the range of 35 to 45 mc/sec for both types of waves. The recorded temperatures were obtained from a chromel-alumel thermocouple with the hot junction located about 3 to 4 mm from the specimen but in contact with the fused silica buffer. Since errors of 2° or 3° K were possible because of natural thermal gradients in the heated zone and fluctuations in the controlling temperatures it was deemed advisable to limit the temperatures of measurement to 928° K, so as to insure against destroying the single crystal character of the samples by the $\alpha \rightleftharpoons \beta$ transformation. In the early stages

TABLE 1 Temperature ranges at which attenuation of ultrasonic waves prevented measurement of wave velocities $\varrho = \text{density}$ V = wave velocity

Crystal Designation	Direction of wave propagation	Type of mode and shear polarization	Stiffness modulus	Temperature ranges of missing data, (° K)
A, A'	100	Long. Shear, [010] Shear, [001]	C11 C66 C55	above 325 600–825
В, В'	010	Long. Shear, [100] Shear, [001]	C22 C66 C44	580–650, above 850 above 340 above 375
С	001	Long. Shear, [010] Shear, [100]	C33 C44 C55	very weak (825–835) above 825
D	$\theta_T \sim 45.5^\circ$ to [001], 90° to [010]	Quasi-long. Quasi-shear, [h0l]	$arrho V^2{}_{ m D}$ $arrho V^2{}_{ m DS}$	above 750
		Pure shear, [010]	$\varrho V^2_{\rm DPS}$	
Е	$\theta_{\rm E} \sim 38^{\circ}$ to [001], 90° to [100]	Quasi-long. Quasi-shear,	$\varrho V^2{}_{\rm E}$	
<i>.</i>		[0kl] Pure-shear, [100]	$arrho V^2_{ m ES}$ $arrho V^2_{ m EPS}$	above 300 above 300
F	$ heta_{ m F} \sim 44.5^\circ$ to [100], 90° to [001]	Quasi-long. Quasi-shear,	$\varrho V^2{}_{\rm F}$	
а		[hk0] Pure-shear,	$\varrho V^2_{\rm FS}$	740-860
		[001]	$QV^2_{\rm FPS}$	700-823

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