DEAT-BC 64-0125

15 March 1

?) in an ideal liquid

$\frac{\xi}{2} = \frac{\beta}{C_p} \frac{\partial \epsilon}{\partial x}$.

velocity, β the the
cific heat at cons
energy absorbed per

e been obtained fo
r impulse of durat
per unit area E_0.
n evaluated at the
= l), may be simpl
α is the optical ab
study). This has
ealized boundary c
s $\sigma(l, t)$ has been d

dary: $\sigma(0, t) = 0$,
ta obtained withou
this condition, σ

$-\alpha v \tau)$, $t' < 0$;

$\alpha v(t' - \tau)$, $0 \leq t'$

$e^{\alpha v \tau})$, $t' > \tau$.

$_0/2C_p\tau$,

l/v.

= 0, approximatin
with the backing
respectively, $\sigma(l,t)$
gative of the corre
(2). During the
en by

$t' - e^{\alpha v(t' - \tau)}$.

of $\sigma(l,t)/\sigma_1$ sh
ing $\tau = 50$ nsec
ed to fit the shar
urve to the expe
ained with the

te and shown in Fig. 2b. This yielded $\alpha = 75$ cm^{-1}. uming then that α is directly proportional to concentration, the remaining theoretical curves, responding to 2.6, 5.2, and 14.2 g/l, were com- ed using α = 150, 300, and 820 cm^{-1}, respectively. value of σ_1 may be computed using the con- nts of distilled water; for E_0 = 0.05 J/cm^2, 3.7 atm.

here is good agreement between the time varia- and relative amplitudes of the experimental theoretical stress profiles shown in Figs. 2 3. Due to a large uncertainty in the experi- tal value of E_0, it is difficult to compare absolute litudes; however, there is at least order of nitude agreement. Thus, these results appear confirm that transient heating is the source of acoustic transients observed in this study.

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amplitude of the stress impulse arising from the tum change of the laser beam would be about atm.

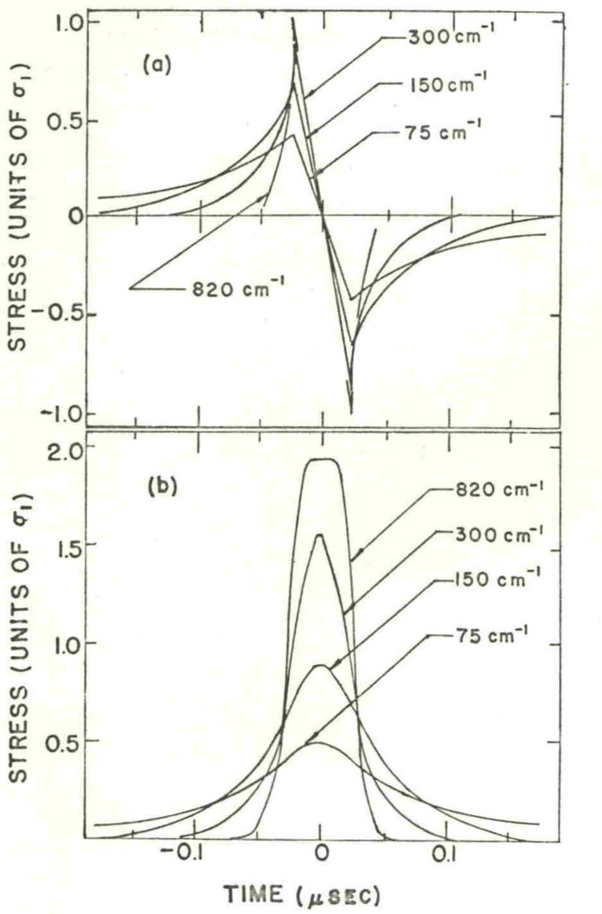

Fig. 3. Theoretical stress impulses produced by transient heating of samples having various optical absorptivities for (*a*) pressure-release boundary conditions, and (*b*) rigid boundary conditions, at the illuminated interface.

CTRICAL RESISTANCE OF BARIUM AT ELEVATED PRESSURE AND TEMPERATURE

B. C. Deaton and D. E. Bowen[1]
Applied Science Laboratory
General Dynamics/Fort Worth
Fort Worth, Texas

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(phase transformations; to 67 kb; to 800°C; E)

rimental results on the melting and poly- ism of barium at elevated temperature and ure were first reported in 1963, the measure- being made by differential thermal analysis.[2] ent data on the electrical resistance of barium mples at pressures to 67 kilobars (kb) and atures to 800°C. Bridgman has published data on room-temperature resistance discontinuities in Ba at 17 and 59 kb,[3,4] and more recently, Balchan and Drickamer[5] found a sharp discontinuity in resistance near 144 kb. Since it has been tentatively assumed that the room-temperature transition at 144 kb corresponds to melting,[2,6] it was felt that a study of the resistance upon melting at lower