Volume of Gas Chamber.

Wt. of tube + bulb empty = 480.5 gm.
Wt. of tube + bulb full of water at 19.5° C = 1036.0 gm.
Volume = 556.5 cc.

The values $\left(\frac{d\rho}{dp}\right)_A$, $\left(\frac{d\rho}{dp}\right)_B$ and $\left(\frac{d\rho}{dp}\right)_{exp.}$ were calculated as already explained.

t	d	p	$\left(\frac{d\rho}{dp}\right)_A \times 10^6$	$\left(\frac{d\rho}{dp}\right)_B \times 10^6$	$\left(\frac{d\rho}{dp}\right)_{exp.} \times 10^6$
22.0° C	2.722	679.9 mm	4.002	3.629	3.873

It is seen that the experimental value agrees with $\left(\frac{d\rho}{dp}\right)_A$ within 3 percent. This is probably within the limits of the experimental errors. On the other hand, it differs by more than 6 percent from the value $\left(\frac{d\rho}{dp}\right)_B$. This is in accord with the results calculated from Natanson's measurements. It can be concluded, therefore, that the rate of reaction even in the dry gas does not correspond to *Assumption B*.

Summary of Conclusions

1. The rate of reaction between nitrogen tetroxide and nitrogen dioxide is so great that there is no appreciable lag in the reaction during the rapid changes of pressure caused by stationary sound waves in nitrogen peroxide.

2. Conclusion 1 holds both for nitrogen peroxide dried over phosphorus pentoxide and for the gas containing 0.32 volume percent of water vapor

3. It is impracticable to use measurements of sound velocity for determining $\frac{C_p}{C_v}$ for nitrogen peroxide.

This research was carried out at the suggestion and under the direction of Dr. F. B. Kenrick. The experimental work was completed at the University of California.

University of Toronto
University of California
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