determinations of the total heat given out on cooling nitrogen peroxide through various intervals of temperature, and taking the heat of dissociation as —(13132 + 2T) cal., Schreber[1] has calculated the values of c'_v and c''_v on the assumption that $c''_v = 2c'_v$. He gives the values 12.85 and 6.43. His calculation, however, contains the erroneous assumption that the heat required to raise the temperature of 92.08 grams of nitrogen peroxide through 1° at constant volume (C_v) is equal to the corresponding value for constant pressure 14.85 cal., (C_p), less 1.985 (instead of $(1 + \alpha)1.985$). Moreover, Schreber's number 14.85 was obtained by averaging the values found for various intervals of temperature ranging from about 290° – 28° to 150° – 28° on the wrong assumption that C_p is independent of the temperature. The specific heat at constant pressure for 92.08 grams must increase with increasing dissociation according to the equation $C_p = C_v + 1.985(1 + \alpha)$. Unfortunately the experimental data on which these values are based are not sufficiently concordant to warrant a strict recalculation. A rough estimate, however, was made as follows:

By taking intervals of temperature Θ (about 25° each) from 290° to 28°, and calculating the values of $\Theta\{(1 - \alpha)c''_p + 2\alpha c'_p\}$ for the averages of the value of α at the upper and lower ends of each interval, and summing these values over intervals corresponding to Berthelot and Ogier's experiments, a set of numbers is obtained whose average is 14.85 when c''_p is taken as 13.4 and c'_p as 7.7.[2] This gives $c''_v = 11.4$ and $c''_v = 5.7$.

The value $c'_v = 5.7$ is low compared with those of other gases of similar formulae, as shown by the following table:

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[1] Zeit. phys. Chem., **24**, 651 (1897).

[2] These values were found after a few approximations. c''_v is assumed equal to $2c'_v$. This assumption is justified to a certain extent by the fact that the relation between density of nitrogen peroxide and temperature is closely represented by an equation of Gibbs' in which this assumption is implied. (See Trans. Conn. Acad., **3**, 244 (1878).)