

therefore cannot be depleted of it, assume that in these animals, too, these reactions are caused by ascorbic acid.

However, there is one exception: the melanin granules in the Langerhans cells and the Malpighian layer of the skin show a reaction which may not be attributed to ascorbic acid, since it persists after methyl alcohol extraction, and does not disappear in the scorbutic guinea pig. This single exception ought not to cause confusion because of the easily recognizable pigment granules.

(2) On the other hand, the absence of reaction with acid silver nitrate may indeed be observed in some tissues rich in ascorbic acid (suprarenal medulla, liver . . .), so that a negative result must not be necessarily interpreted as indicating the absence of ascorbic acid.

The chief reason for this failure to reduce silver nitrate is the presence in the organs of factors inhibiting the reduction of ascorbic acid; these 'inhibiting factors' have been described by Huszak<sup>8</sup> in the suprarenal medulla and by de Caro and Giani<sup>9</sup> in other tissues.

In short, the absence of a coloration by acid silver nitrate does not necessarily mean the absence of ascorbic acid, but a positive reaction is a very specific test for this substance.

it is logical to The following relations are applied<sup>2</sup>:

$$K_1 = \frac{2\pi N}{15kT} \left[ (b_1 - b_2)^2 \frac{n_\infty^2 - 1}{n_D^2 - 1} \right] = 2.629 \times 10^{32} \left[ (b_1 - b_2)^2 \frac{n_\infty^2 - 1}{n_D^2 - 1} \right] \quad (1)$$

$$K_1 = \frac{3 \Delta}{2\pi kNT(6-7 \Delta)} (n_\infty - 1)(n_D - 1) = 9.477 \times 10^{-8} (n_\infty - 1)(n_D - 1) \quad (2)$$

$$K_2 = \frac{2\pi N}{15k^2 T^2} \mu^2 (b_1 - b_2) = 6.545 \times 10^{45} \mu^2 (b_1 - b_2) \quad (3)$$

$$K = K_1 + K_2 \quad (4)$$

where the symbols have their usual significance.

The value of  $K_1$  by (1) is probably more accurate than by (2), and is independent of the result  $\Delta_{HX} = a$  constant. As an approximate check on the theory by which these numbers are derived, however, the value of  $K_1$  by (2) is substituted in (1) to obtain a calculated value of  $b_1 - b_2$ , for comparison with that derived from the estimated  $b_1$ 's and  $b_2$ 's given above. Comparison of the last two columns of the following scheme shows the general run of the numbers to be in agreement.

Di-atom	$K_1$ by (1), $K_2$ , $K$ ( $\times 10^{15}$ )			$K_1$ by (2)	$b_1 - b_2$ ( $\times 10^{24}$ )	
					est.	calc.
HF	0.015	(3.922)	(3.94)	0.018	0.24	0.26
HCl	0.152	5.662	5.81	0.184	0.77	1.18
HBr	0.281	4.399	4.68	0.345	1.05	1.16
HI	0.615	1.717	2.33	0.769	1.56	1.96

$K_{HCl}$  agrees closely, as expected, with the experimental value  $5.75 \times 10^{-16}$  (Hansen<sup>2</sup>). The constants for other wave-lengths can be estimated by this method as required.

It is noteworthy that HCl appears to have the highest constant in the group. As, however,  $K_2$  is very sensitive to changes in  $\mu$ , this may not be significant. If  $\mu_{HF}$  were as large as 2.0 (Smallwood<sup>3</sup>),  $K_2 = 6.282$ ,  $K = 6.30$ , making the gradation continuous from HF to HI.

The present results appear to support the theory put forward in the former communication<sup>1</sup>.

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<sup>1</sup> C. H. Douglas Clark, NATURE [July 18, p. 126].

<sup>2</sup> H. A. Stuart, Z. Phys., 65, 358 (1929).

<sup>3</sup> H. W. Smallwood, Z. phys. Chem., B, 19, 242 (1932).

### Kerr Constants of the Hydrogen Halide Gases

ON the basis of a recent note dealing with the polarization ellipsoids of the hydrogen halide gases<sup>1</sup>, it becomes possible to calculate their Kerr constants (Na-D line, 20° C., 760 mm.), numbers which should be directly capable of experimental verification.

We take the Boltzmann constant  $k = 1.371 \times 10^{-16}$  erg per degree per molecule,  $T = 293^\circ \text{K}$ ,  $\pi = 3.1416$ ,  $N = (6.064 \times 10^{23} \times 273)/(22,414 \times 293) = 2.522 \times 10^{19}$ , and  $\Delta_{HX} = 0.0119$ . Further experimental and estimated constants, different for the four halides, are taken as follows:

Di-atom	$n_D$	$n_\infty$	$\mu$	$b_1$	$b_2$
HF	1.000140	1.000136	$1.58 \times 10^{-18}$	$0.96 \times 10^{-24}$	$0.72 \times 10^{-24}$
HCl	1.000446	1.000435	1.06	3.07	2.30
HBr	1.000612	1.000594	0.80	4.19	3.14
HI	1.000919	1.000883	0.41	6.24	4.68

### The 2.73 $\mu$ Absorption Band in Fused Silica

LYON and Ellis in a recent note<sup>1</sup> refer to the absence of the 2.73  $\mu$  infra-red absorption band in specimens of fused silica examined by them, and suggest that the band found at this wave-length by previous investigators may be due to an impurity, possibly CO<sub>2</sub> or H<sub>2</sub>O.

It is certainly unlikely, as I have previously pointed out<sup>2</sup>, that it can be due to vitreous SiO<sub>2</sub>, since the absorption coefficient at the centre of this band was widely different in specimens examined by Parlin<sup>3</sup> ( $K = 0.52$ ), Dreisch<sup>4</sup> ( $K = 0.33$ ) and me<sup>5</sup> ( $K = 0.03$ ) and, further, crystalline quartz shows no trace of such a band whilst every other band in fused silica between 1 and 7.5  $\mu$  has its counterpart in the crystalline quartz spectrum.