101. *Optical Rotatory Dispersion of (—)Tetrahydrofurfuryl Alcohol.*

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A two-term Drude equation is given which fits the rotatory dispersion of (—)tetrahydrofurfuryl alcohol recorded by Balfe, Irwin, and Kenyon (J., 1941, 312).

Balfe, Irwin, and Kenyon (*loc. cit.*) described the anomalous rotatory dispersion of (—)tetrahydrofurfuryl alcohol, but could not derive a Drude equation to fit the experimental results; they used seven-figure logarithms for the calculation. Working to ten figures with a calculating machine, we have now obtained a two-term equation which fits the observations, and the calculation shows that at least eight figures are required for its solution.

The equation, for observed rotatory power in a 2-dm. column at 20°, is

$$\alpha_{\lambda}^{20^\circ} = 42{\cdot}071/(\lambda^2 - 0{\cdot}03428) - 45{\cdot}917/(\lambda^2 - 0{\cdot}01712)$$

the characteristic frequencies being 1852 and 1308 A., indicating that both anisotropic centres in the molecules are associated with absorption bands of very low wave-length, in harmony with the formal saturation of the alcohol.

In the table, the observed rotatory powers are compared with those calculated from the above equation. The agreement is good, except for the observation at the lowest wave-length (3340 A.) where the curve has passed into the absorption band (absorption commenced at 3603 A.). From the equation, the following characteristics of the dispersion can be calculated (Lowry " Optical Rotatory Power," 1935, p. 139) :

Inflection at 7838 A. This is above the maximum wave-length at which observations were made.

Maximum at 6465 A. This is close to the maximum wave-length used, but the experimental results do indicate a maximum between 6200 and 6700 A.

Reversal of sign at 4711 A. The curve drawn through the experimental points crosses the axis of zero rotatory power at 4715 A.

[Observed rotatory powers in Roman type are from Table I of Balfe, Irwin, and Kenyon (*loc. cit.*), those in italics are from Table II; * indicates a numerical value taken from the rotatory powers of the (+)alcohol in Table II, and † indicates the four observations used as a basis for calculating the equation, except that at λ 6438, a value of −4·90° was taken, this being read from a smoothed curve through the experimental points.]

λ, A.	α, obs.	α, calc.	Diff.
6708	−4·70°	−4·87°	+0·17°
6438	4·97†	4·90	−0·07
	_4·85_*		+0·05
	_4·87_		+0·03
6104	4·59	4·81	+0·22
5893	4·54	4·67	+0·13
	_4·65_		+0·02
	_4·64_*		+0·03
5780	4·47	4·54	+0·07
	_4·44_		+0·10
	_4·46_*		+0·08
5461	3·95°†	3·95°	0·00°
	_3·95_		0·00
	_3·98_*		−0·03
5086	2·72	2·60	−0·12
	_2·60_		0·00
	_2·64_*		−0·04
4800	−0·96	−0·77	−0·19
	_0·78_*		−0·01
4603	+1·18	+1·13	+0·05
4529	2·0	2·02	−0·02
4384	4·0	4·14	−0·14
4358	_4·80_	4·58	+0·22
	_4·63_*		+0·05
4282	6·0°†	6·00°	0·00°
4191	8·0	7·95	+0·05
4108	10·0	10·04	−0·04
4032	12·0	12·25	−0·25
3978	14·0	14·02	−0·02
3917	16·0	16·24	−0·24
3872	18·0	18·05	−0·05
3767	23·0	22·93	+0·07
3669	28·0	28·51	−0·51
3603	33·0	32·92	+0·08
3392	52·0†	51·99	+0·01
3340	60·0	58·20	+1·80

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