STUDIES ON THE RELATION BETWEEN CHEMICAL CONSTITUTION AND ULTRAVIOLET ABSORPTION SPECTRA OF OPTICALLY ACTIVE AND RACEMIC COMPOUNDS

Part VII. Correlation of Absorption Maxima, $\lambda_{\text{max}}$, and Characteristic Wavelengths, $\lambda_0$, of Camphor-\(\beta\)-Sulphonyl-phenyl, -tolyl (o-, m- and p-) and Naphthyl (a- and \(\beta\)-) amides

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ABSTRACT

The ultraviolet absorption spectra of camphor-\(\beta\)-sulphonyl-phenyl, (o-, m- and p-) tolyl, (a- and \(\beta\)-) naphthylamides have been determined in methyl alcohol, ethyl alcohol, and chloroform. The absorption spectra of all the compounds show two absorption bands: one varying from 267 to 284 m\(\mu\), the longer absorption maximum ($\lambda_{\text{max}}$) due to selective absorption of the keto group, and the other shorter one, ranging from 226 to 230 m\(\mu\), due to general absorption of the saturated molecules. The values of the characteristic wavelengths, $\lambda_0$, obtained from Drude's one-term equation, have been compared with the absorption maxima, $\lambda_{\text{max}}$, obtained by direct measurements. There are marked discrepancies in the values of $\lambda_0$ and $\lambda_{\text{max}}$. An explanation of the discrepancies is given.

The nature of racemic modifications of the compounds has also been discussed.

In continuation of Part VI\(^1\) of this series, we describe, in this communication, the ultraviolet absorption spectra of (d and dl) camphor-\(\beta\)-sulphonyl-phenyl, o-tolyl, m-tolyl, p-tolyl and naphthyl (a- and \(\beta\)-)-amides in methyl alcohol, ethyl alcohol and chloroform. The ‘characteristic’ wavelengths, $\lambda_{05}$, calculated from Drude's rotatory dispersion one-term equation\(^2\) have been compared with the absorption maxima, $\lambda_{\text{max}}$, obtained by direct measurements.

The absorption measurements of the dextro and the racemic forms of these compounds have been studied with a view to throw further light on the nature of these racemic modifications investigated by us\(^8\) earlier by the application of melting point-composition diagram of Roozeboom,
The compounds mentioned above were prepared and purified according to methods described previously. The absorption measurements were carried out in spectroscopically pure solvents with Beckman DU Spectrophotometer. The molecular extinction coefficients, $\epsilon$, were calculated from optical density at different wavelengths, but only their peak values ($\epsilon_{\text{max}}$) corresponding to the absorption maxima, $\lambda_{\text{max}}$, are given in Table I. The absorption spectra curves (Figs. 1-6) were prepared by plotting the molecular extinction coefficients ($\epsilon$) against the corresponding wavelengths ($\lambda$).

The rotatory dispersion of $d$-camphor-$\beta$-sulphonyl-$\alpha$-naphthylamide, which was not given in chloroform in the earlier paper, has been determined and recorded in Table VI.

**DISCUSSION**

The most frequent representation of rotatory dispersion is given by Drude's equation,

$$
[a] = \sum \frac{K}{\lambda^2 - \lambda_0^2}.
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