Solutions were equilibrated against sodium chloride or sulfuric acid solutions and the following pairs of solutions (Table I) were found to have equal vapor pressure at 25°.

Osmotic and activity coefficients were evaluated relative to the corresponding values for the reference electrolytes[3] with the following results (Table II).

TABLE II

m	φ	γ	m	φ	γ
0.1	0.938	0.788	4.0	1.270	1.125
.2	.935	.752	5.0	1.352	1.310
.3	.940	.736	6.0	1.426	1.515
.5	.954	.726	7.0	1.490	1.734
.7	.970	.729	8.0	1.544	1.960
1.0	.997	.743	9.0	1.593	2.202
1.5	1.043	.783	10.0	1.637	2.455
2.0	1.088	.835	11.0	1.674	2.711
2.5	1.134	.896	12.0	1.704	2.967
3.0	1.181	.966	13.0	1.735	3.242
3.5	1.227	1.044	13.5	1.754	3.398

The saturated solution contained 45.87% of lithium nitrate. Campbell[4] gives 46.0% as the solubility. The water activities corresponding to the above osmotic coefficients are higher by approximately 0.0020 over the range 2 to 9 M than those measured by Pearce and Nelson,[5] the difference rising to 0.0080 at 12.87 M.

(3) S. Shankman and A. R. Gordon, THIS JOURNAL, **61**, 2370 (1939); P. Olynyk and A. R. Gordon, *ibid.*, **65**, 224 (1943); R. A. Robinson, *Trans. Roy. Soc., N. Z.*, **75**, 203 (1945); R. H. Stokes and B. J. Levien, THIS JOURNAL, **68**, 333 (1946).

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Ultraviolet Absorption Spectra of Mescaline Sulfate and β-Phenylethylamine Sulfate

BY KURT SALOMON AND ALBERT F. BINA

The following is a report on the results of a spectrographic study of the absorption spectra of mescaline sulfate (3,4,5-trimethoxy-β-phenylethylamine sulfate) and β-phenylethylamine sulfate.

Mescaline has specific pharmacological properties, such as production of color hallucinations in man, while β-phenylethylamine does not exhibit the aforementioned effects. It has been shown by various workers[1,2,3] that the introduction of methoxy groups in the phenylethylamine molecule greatly influences the metabolic fate of this compound by rendering it more resistant to oxidation. Further information about the interrelationship of methoxy groups and the physical and chemical properties of the molecule is therefore desirable.

Only a few experimental studies concerning the influence of methoxy groups on the ultraviolet absorption spectra of benzene and its derivatives have been reported. Hillmer and Schornig[4] have established the fact that introduction of methoxy groups into the benzene ring in presence or absence of various side chains produces simplification of the fine structure of the absorption curve as well as a shifting of the maxima toward the visible region. This shift was in the order of magnitude of ten to twenty millimicrons, depending on the number of methoxy groups introduced and the character of the side chain present. Furthermore, they state that the intensity of the absorption increases with the introduction of methoxy groups. Our results are in agreement with their findings.

Experimental

The ultraviolet absorption spectra were measured with a Beckman Quartz Spectrophotometer. Measurements were made in 80% ethyl alcohol. Crystalline mescaline sulfate was used in these experiments; the melting point of this preparation was 181–184° (uncor.).[5] The β-phenylethylamine used was obtained from Eastman Kodak Company with the information that it has a boiling point from 89–90.5° at 15 mm. pressure. The measurements on this compound were made immediately after redistillation *in vacuo*. In order to produce β-phenylethylamine sulfate for measurements, 0.1 cc. of concentrated sulfuric acid was added to the β-phenylethylamine solution to be measured. The concentrations of mescaline sulfate used were in the range of 25 micrograms per ml. (8×10^{-5} molar) to 100 micrograms per ml. (32×10^{-5} molar). The concentrations of β-phenylethylamine sulfate were in the range of 400 micrograms per ml. (36×10^{-4} molar) to 800 micrograms per ml. (72×10^{-4} molar).

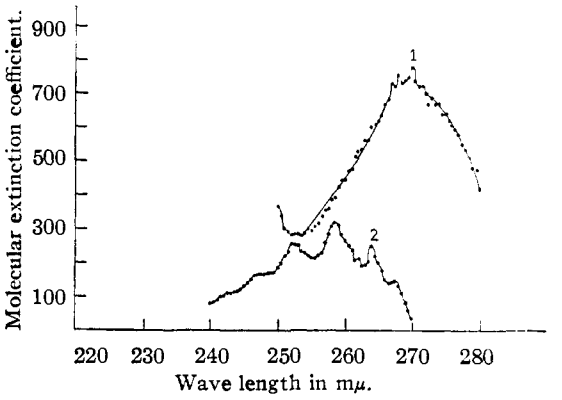

Fig. 1.—1, Mescaline sulfate in 80% ethyl alcohol; 2, β-phenylethylamine sulfate in 80% ethyl alcohol.

Preliminary experiments show that mescaline can be extracted from an alkaline water solution into isobutyl alcohol. The amount of mescaline can then be estimated by measuring the intensity of absorption at the absorption peak. The absorption spectrum of mescaline is identical in ethyl alcohol and in isobutanol.

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