The apparently stoichiometric oxidation of tryptophan by 3 atoms of oxygen leaves room for different interpretations which cannot be evaluated without further work. In addition to the behavior of these three compounds it seems worth noting that in contrast to their behavior with periodic acid, the hydroxy amino acids are not distinguished by a special reactivity toward performic acid.

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Density and Refractive Index of Cumene

BY JAMES E. TROYAN

In a recent investigation of alkyl benzenes at this Laboratory, the variation with temperature of density and refractive index of cumene (isopropyl benzene) was determined. Previous data on these properties had been found in the literature, but the inconsistency in published values led to the new measurements reported in this article.

The plots of densities and of refractive indices against temperatures defined curves which were fitted to the general equation, d^t_4 or $n^t_D = a + bt + ct^2$, by the method of least squares. The following expressions were obtained

Density — $d^t_4 = 0.8777 - 0.73 \times 10^{-3}t - 2.8 \times 10^{-6}t^2$
R. I. — $n^t_D = 1.5017 - 0.54 \times 10^{-3}t + 0.46 \times 10^{-6}t^2$

Densities were determined by means of pycnometer weighings between 6.1° and 37.8°. The close agreement between experimental data and the calculated curve is shown in Fig. 1. The
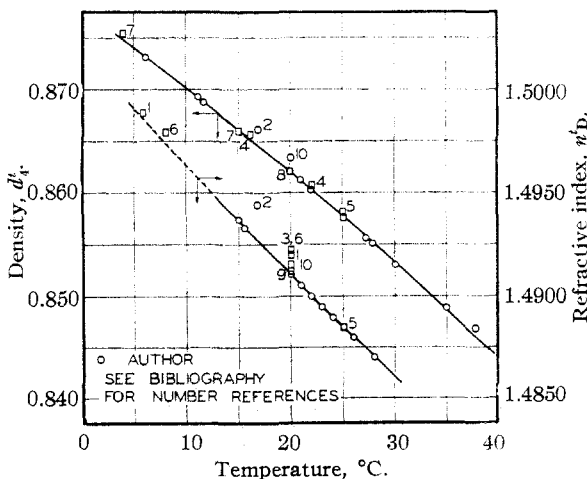

Fig. 1.

average deviation of individual points from this curve is ±0.0001 or about 0.01%. Refractive indices were measured with an Abbé refractometer at temperatures ranging from 15–28°. Experi-

mental points, which are likewise plotted in Fig. 1, show an average deviation of only 0.002% from values indicated by the curve of the R. I. equation given above. Density and R. I. data reported by other investigators are included for comparison with the author's results.

Best grade Eastman Kodak Company cumene was used in these measurements without any further purification. This was considered acceptable since the density and refractive index of the middle cut of a redistillation (b. p. 152–153°) were not significantly different from those of the original material, which had the following properties: b. p. 151–153°, f. p. −95.2°, d^{20}_4 0.8620, n^{20}_D 1.4911. By comparison, best values in the literature are: b. p. 152.5°, f. p. −96.2°, d^{20}_4 0.8620, n^{20}_D 1.4912–1.4920.

Although the author's data may be limited somewhat in accuracy by the purity of the cumene used, it is assumed that the equations offered here are sufficiently reliable for general use in industry.

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NEW COMPOUNDS

4-Nitrodiphenyl Ether-4'-Sulfonyl Chloride and -4'-Sulfonamide

p-Nitrodiphenyl ether was sulfonated by heating and stirring with concentrated sulfuric acid until test portions were completely soluble in water. The sodium salt was isolated, dried and converted to the sulfonyl chloride with phosphorus pentachloride. The light cream-colored sulfonyl chloride was recrystallized from isopropyl ether: m. p. 84−85° (cor.). It was analyzed by refluxing a weighed portion in 50% ethanol for three hours, evaporating to dryness repeatedly on the steam-bath to remove hydrogen chloride, and titrating the residual sulfonic acid with standard alkali.[1]

Anal. Calcd. for $C_{12}H_8O_5NSCl$: equiv. wt., 314. Found: equiv. wt., 322.

(1) Cf. Davis and Davies. J. Chem. Soc., 123, 2976 (1923).