LETTERS TO THE EDITOR

DIPOLE MOMENTS OF CERTAIN CHOLESTERYL COMPOUNDS

MANY investigations have been carried out on the dielectric properties of liquid crystalline substances in the mesophases. Of these the nematic type of mesophase has been studied extensively and a review of the work has been given by Grey[1] and Brown and Shaw.[2] As a part of systematic investigation on the dielectric properties of liquid crystals of cholesteric type the dipole moments of eight compounds for which the data had not been reported previously have been determined and reported here. These are six cholesteric esters formate, acetate, propionate, *n*-butyrate, *n*-valerate, benzoate and cholesteryl chloride and bromide.

The dielectric constant of solutions of these in two non-polar solvents benzene and carbon tetrachloride were determined using Franklin oscillator wave-meter combination at 1 Mc./sec. described by Le Fevre, Ross and Smyth.[3] The moment values were computed using Guggenheim's[4] modified equation for orientation polarisation.

$$P_0 = \frac{3}{(\epsilon_1 + 2)^2} \frac{M}{d_1} \triangle$$

the symbols having their usual significance.

The values of the dipole moments in the two solvents are given in Table I.

TABLE I

Dipole moments of cholesteryl compounds

Compound	μ in Debye Units	
	Benzene	Carbon Tetrachloride
Formate ..	2·55	3·26
Acetate ..	1·90	2·09
Propionate ..	2·03	2·36
Butyrate ..	1·91	2·19
n-Valerate ..	2·48	3·30
Benzoate ..	1·85	2·08
Chloride ..	4·40	3·45
Bromide ..	2·40	2·86

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RELAXATION TIMES OF MIXTURES OF BENZALDEHYDES IN BENZENE

ACCORDING to Schallamach,[1] Bauer[2] and Magat,[3] only a single relaxation time is involved for a microscopically homogeneous liquid, even if it is a mixture. Following this suggestion the authors have determined the relaxation times of two mixtures namely o-chlorobenzaldehyde + *m*-chlorobenzaldehyde and benzaldehyde + *m*-chlorobenzaldehyde in dilute solutions of benzene at 3 cm. using the concentration variation method of Gopala Krishna.[4] The technique of Roberts and von Hippel[5,6] described earlier was adopted for determining the dielectric constants (ϵ') and dielectric loss factors (ϵ'') of solutions. As the wavelengths of maximum absorption for the pairs of polar molecules selected lie very near to each other, a single relaxation time may be expected showing the superimposed effect of the pair.

Five solutions of increasing concentration were made by accurately mixing equal volumes of the two components in 10 ml. of benzene. The relaxation times obtained are given in Table I.

TABLE I

Relaxation times of mixtures of benzaldehydes

(f = 9567 Mc./sec , Temperature = 27° C.)

	Mixture	$\tau_{mix.} \times 10^{12}$ sec.	$\tau'_{comp.} \times 10^{12}$ sec.
1	*o*-Chlorobenzaldehyde + *m*-chlorobenzaldehyde ..	11·3	11·0 12·5
2	Benzaldehyde + *m*-chlorobenzaldehyde ..	11·5	10·6 12·5

The results show that for both the pairs, the relaxation time is very nearly equal to the average of the relaxation times of the two components. A similar result was obtained earlier by Srivastava.[8]

fundamentals obtained, along with the visual estimates of their relative intensities given in parentheses, are presented in Table I for the different molecules studied.

TABLE I

Molecule	(0, 0) band in cm.$^{-1}$	Fundamentals in cm.$^{-1}$	
		Ground state	Excited state
2-methyl quinoline ..	31999 (7)	464 (0), 526 (0), 719 (0)	442 (1), 674 (2), 938 (1), 1185 (0), 1351 (2), 1437 (3)
4-methyl quinoline ..	32152 (6)	..	540 (1), 662 (0), 999 (1), 1195 (0), 1371 (2)
6-methyl quinoline ..	31759 (6)	..	506 (0), 678 (1), 965 (0), 1067 (0), 1373 (2)
7 methyl quinoline ..	31836 (6)	..	401 (0), 650 (1), 1096 (0), 1371 (2)

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ELECTRONIC ABSORPTION SPECTRA OF 2-, 4-, 6- AND 7-METHYL QUINOLINE VAPOURS

USING path lengths varying from 25 to 200 cm. and temperatures from room temperature to 200° C., the absorption spectra of 2-, 4-, 6- and 7-methyl quinolines have been photographed in the vapour phase in the near ultra-violet region on a medium quartz spectrograph. Before use, the samples supplied by Light & Co., were distilled in vacuum.

The spectrum of each of the molecules studied consists of 10 to 15 somewhat broad, red-degraded bands lying approximately in the region λ 3200 to λ 2800 Å. The spectra have been analysed with the help of the Raman data[1] on 2- and 4-methyl quinolines and the infra-red data[2-4] on all the molecules. These molecules belong to the point group C_s assuming CH_3 to be a single unit and the bands are ascribed to the transition $^1L_b - {}^1A$ ($^1A' - {}^1A'$). The wave-numbers of the (0, 0) bands, and the

Although the spectra have been photographed under different possible experimental conditions, it has not been possible to record any bands corresponding to ground state fundamentals except for three weak bands in the case of 2-methyl quinoline, shown in the table.

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PREPARATION OF CHROMIUM-51 OF HIGH SPECIFIC ACTIVITY FOR MEDICAL USE

INTRODUCTION

CHROMIUM-51 of high specific activity (greater than 15 curies per gram) and purity is used in medicine in the determination of blood volume, for studies of red cell survival time and for labelling proteins.[1,2] For certain other studies, however, a product of much higher specific activity (100 curies per gram) is desirable.[3] Direct activation of natural chromium gives chromium-51 of low specific activity which is unsuitable for medical use. However enriched chromium-50 (natural abundance 4·4%) can be irradiated to produce high specific activity chromium-51; but this method is not feasible in India. The possibility of enhancing the specific activity of chromium-51 by recoil enrichment has been studied by a number of