

Table 2 Data on molar polarizations and dipole moments of hexahydro-s-triazine at 25°C

Compound		$P_{2(\infty)}$ (cc)			$P_o$ cc	$\mu$ Debye
		$C_6H_6$	$CCl_4$	Hedestrand's method		
I	1,3,5-triphenyl- hexahydro-s-triazine	129.0	122.0	125.0	27.6	1.16
II	1,3,5-tri-(4-methyl)- phenyl-	149.5	146.0	147.0	18.5	0.98
III	1,3,5-tri-(4-chloro)- phenyl-	156.0	153.2	157.2	99.1	2.20
IV	1,3,5-tri-(4-methoxy)- phenyl-	160.5	160.2	165.2	46.1	1.50
V	1,3,5-tri-(4-ethoxy)- phenyl-	150.0	155.8	158.0	74.0	1.95
VI	1,3,5-tri-(4-nitro)- phenyl-	140.0	140.0	141.8	128.0	2.50

which is the sum of orientation polarization  $P_o$  and induced polarization  $P_i$ .  $P_i$  is the sum of electronic polarization  $P_e$  and atomic polarization  $P_a$ .  $P_e = R_{M_{2(\infty)}}$  and  $P_a \approx 0.15 R_{M_{2(\infty)}}$ . The molar refractivity  $R_{M_{2(\infty)}}$  of solutes is determined from the extrapolation of the plots of  $R_{1,2} = f(x_2)$  as  $x_2$  tends to zero.

The values of permanent electric moments of the six phenyl substituted hexahydro-s-triazines are listed in table 2. The dipole moment values clearly support the idea of the existence of stereochemical isomerism in these compounds. On comparing the permanent dipole moment values of individual compounds from I to VI, it is seen that if the para-substituent in the phenyl ring has a positive inductive effect (+I) the d.m. value ( $\mu$ ) decreases and if it has a negative inductive effect (-I) the d.m. value increases. The reason may be laid as follows. The distortion of the chair or boat conformation may occur due to the lone pair-lone pair repulsion which is enhanced in case of +I effect substituents. Also, due to the electron withdrawal of the -I effect

substituents, the repulsion between the lone pairs diminishes and the probability of a proper alignment of the lone pairs along the same direction would be greater. This effect leads to a comparative increase in the dipole moment for compounds with -I effect phenyl ring substituents.

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## ERRATUM

The date of receipt of the following article was not mentioned by oversight:

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