which have the rock-salt type of structure. A different explanation is suggested in interpreting the results for the lithium halides. These crystals are composed of the small Li^+ ion and the relatively large Cl^-, Br^- and I^- ions ; the negative ions here approach more closely than in the other halides, and the greater electrostatic repulsions produce larger interatomic distances than would be expected from considerations of the 'sizes' which these ions have in the other halides[3]. The conclusion we draw is that the interatomic forces which thrust apart the negative ions in the lithium halides and result in a change of structure in the case of the cæsium halides produce deformations of the ions which *lower* their susceptibilities. We find that this conclusion holds good also for the ammonium halides, the chloride and bromide of which normally have the CsCl type of structure and show low values for their susceptibilities, while the iodide has the NaCl type of structure and gives a normal susceptibility.

A detailed account of this work will appear elsewhere.

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[1] See E. C. Stoner, "Magnetism and Matter", chap. ix (Methuen, 1934).
[2] F. E. Hoare, *Proc. Roy. Soc.*, A, **147**, 88 ; 1934.
[3] See L. Pauling, *Z. Krist.*, **67**, 377 ; 1928. W. Zachariasen, *Z. Krist.*, **80**, 137 ; 1931.

Variation of the Carbon-Halogen Link Distances in Different Types of Organic Structure

THE improved electron diffraction method[1] of determining molecular structure in the vapour phase has brought to light the fact that the distance between a carbon and halogen atom depends on the character of the binding attaching the carbon atom to other atoms in the system. Hitherto, the magnitude of this distance has been regarded as constant. We have shown that the carbon-halogen distance is smaller in aromatic compounds than are the accepted values for the aliphatic series[2]. This suggested that an investigation of certain aliphatic, ethylenic and

	Aliphatic $>C-Hal.$		Ethylenic $=C\diagdown^{Hal.}_{Hal.}$		Aromatic $\diagdown C-Hal.$	Acetylenic $\equiv C-Hal.$
Link	New	Old	New	Old	New	
C–Cl	1·76[3]	1·82[4,5]	1·74	1·82[7,6]	1·69	—
C–Br	1·93	2·05[4,6]	1·91	2·05[5]	1·88	1·84
C–I	2·12	2·28[6]	2·10	—	2·05	2·03
	CCl_4		*Trans.* $C_2H_2Cl_2$		C_6Cl_6	Dibrom-
			,, $C_2H_2Br_2$		C_6Br_6	acetylene
	CBr_4		,, $C_2H_2I_2$			
					Sym. $C_6H_3Br_3$	Diiodo-
	CHI_3		C_2Cl_4		,, $C_6H_3I_3$	acetylene
			C_2Br_4			
			C_2I_4		$p-$ $C_6H_4Br_2$	
					$p-$ $C_6H_4I_2$	

acetylenic compounds by electron diffraction might throw more light on this question.

The 'new' results are tabulated above, showing that the carbon-halogen link distances in angstroms

decrease from left to right and are not constant, as the 'old' results would seem to indicate. The order of accuracy is $\pm 0\cdot01$ A. Below each column we give a list of the substances used for this work, the results of which will be published shortly in greater detail.

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[1] de Laszlo, *Proc. Roy. Soc.*, A, **146**, 662 ; 1934.
[2] de Laszlo, *ibid.*, **143**, 690 ; 1934.
[3] Cosslett and de Laszlo, NATURE, **134**, 63 ; 1934.
[4] Wierl, *Ann. Phys.*, **8**, 521 ; 1931.
[5] Dornte, *J. Chem. Phys.*, **7**, 567 ; 1933.
[6] Dornte, *ibid.*, **1**, 630 ; 1933.
[7] Wierl, *Ann. Phys.*, **13**, 553 ; 1932.

Dipole Moment of Acetonitrile

ALTHOUGH several determinations of the dipole moment of acetonitrile have been made, considerable uncertainty attached to the results since the values of different observers varied widely. The figures already published for this compound are as follows :

		μ	Temp.
Williams, *Z. physikal. Chem.*, **138**, 75 ;	1928	3·4 D	25° C.
Werner, *ibid.*, B, **4**, 371 ;	1929	3·11	20°
Eide and Hassel, *Tids. Kjemi.*, **10**, 93 ;	1930	3·51	—
Hunter and Partington, *J.C.S.*, 2812 ;	1932	3·16	20°
Snoek, *Physikal. Z.*, **35**, 196 ;	1934	3·45	25°

In all cases the solvent was benzene.

We recently remeasured the moment of acetonitrile in connexion with some other work, shortly to be published, and have found a value $\mu = 3\cdot44 \pm 0\cdot02$ D at 20°. This figure is in excellent agreement with that obtained by Snoek.

The two lowest values quoted above were both found using acetonitrile which had been repeatedly fractionated with phosphorus pentoxide. This treatment would not remove traces of acetic acid formed by slight hydrolysis of the cyanide, and possibly the low values are in part due to this cause. It may be noted that the moment of acetic acid in solution is about $0\cdot8$ D (Wolf ; *Physikal. Z.*, **31**, 227 ; 1930) although smaller values have been recorded.

In the present experiments, Kahlbaum's acetonitrile was purified by standing over caustic potash to remove any traces of acid, was then left in contact with calcium chloride for a week to remove any ammonia, and was finally dried with phosphorus pentoxide. It was twice fractionated over phosphorus pentoxide, and had a constant boiling point $81\cdot6°$C./760 mm.; d_4^{20} $0\cdot7823$; n_D^{20} $1\cdot3438$. Kahlbaum's benzene was used as solvent.

The dielectric constants have been measured on an improved form of the apparatus previously used by us, which we shall describe elsewhere.

The polarisations of acetonitrile are : $P_{2\infty} = 262 \pm 1\cdot5$ c.c. ; $P_E = 11\cdot1$ c.c. ; $\mu = 3\cdot44 \pm 0\cdot02$ D.

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