Preliminary Communications

A New Isomer of Hexachloro-Cyclohexane with Zero Dipole Moment

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The determination of the molecular structure of the different benzene hexachlorides $(CHCl)_6$ would be of great interest, but demands a considerable amount of precise work. The only isomer the configuration of which is well established is the symmetrical β compound [1] in which the Cl atoms have the positions $\varkappa,\varkappa,\varkappa,\varkappa,\varkappa,\varkappa$. Besides this substance a second isomer with zero dipole moment should exist in which the chlorine atoms 1 and 4 are in ε positions $(\varepsilon,\varkappa,\varkappa,\varepsilon,\varkappa,\varkappa)$. It is known that the α, γ and δ isomers have considerable dipole moments, the moment of the ε isomer [2] has not been determined.

Cyclohexane and monochloro-cyclohexane were treated with gasous chlorine under cooling but using strong artificial light until no further absorbtion of chlorine could be observed. From the different fractions obtained by distillation *in vacuo* of the reaction product some new substances were prepared. One of these is a chloride $C_6H_6Cl_6$ of m. p. 145° C obtained from the most volatile part of the product.

$C_6H_6Cl_6$		
Calc.	Mol. wt. 290.9	Cl 73.1
Found	» » 285, 286	» 72.0, 72.5

(Cryoscopic molecular weight determination in benzene.)

Monoclinic unit cell contains 4 molecules ($a = 11.1$, $b = 6.78$, $c = 14.0$; $\beta = 98°$).

The result of dielectric constant measurements of very dilute solutions in benzene and carbon tetrachloride may be expressed by the ratio $\frac{\Delta\varepsilon}{x}$ (x being the mole fraction of hexachloride):

	C_6H_6	CCl_4	
New substance:	0.552	0.536	(x ranging from 0,001 —0,007)
β isomer:	0.847	—	(x = 0,002)

There can be little doubt that the dipole moment is in fact zero. If we exclude the possibility (which seems very improbable) that the substance contains two CCl_2-groups and two CH_2-groups, the conclusion must be drawn that the new substance is in fact a sixth isomer in the series of benzene hexachlorides having the configuration of Cl atoms given above ($\varepsilon,\varkappa.\varkappa.\varepsilon,\varkappa,\varkappa$). (Small quantities of the converted, energetically less stable configuration $\varkappa,\varepsilon,\varepsilon,\varkappa,\varepsilon,\varepsilon$ may occur in solution or in the vapour). We therefore propose the designation ζ benzene hexachloride for the new substance.

Preliminary experiments on insects indicate that the isomer is almost inactive as a contact poison.

1. Hassel, O. *Tids. Kjemi, Bergv. Met.* 3 (1943) 32.
2. Kauer, K. C., DuVall, R. B., and Alquist, F. N. *Ind. Eng. Chem.* 39 (1947) 1335.

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Note on the Clevage of Insulin by Chymotrypsin

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Crystalline insulin has been digested with crystalline chymotrypsin until the amino nitrogen was constant. The reaction