method the phenylthiocarbamyl (PTC) peptide in nitromethane solution is split by hydrogen chloride. However, the solvent properties of nitromethane restrict the method to short peptides. In order to extend the range several workers ^{2,3,4} have employed water as a solvent but unfortunately the cleavage in aqueous acids does not proceed smoothly. We therefore wish to point out that acetic acid has favorable properties as a solvent in this reaction.

Anhydrous acetic acid saturated at room temperature with dry hydrogen chloride (approx. 2 *M*) brings about a rapid and complete cleavage of PTC-peptides. The fission in this medium of 0.01 *M* solutions of PTC-alanylglycine ¹ and PTC-leucylglycine ¹ at 37° C was followed by amino nitrogen determinations ^{5,6}. The reaction was found to be complete in less than 3 minutes.

Acetic acid with a small content of water dissolves large peptides and even many proteins. The effect on the reaction caused by the addition of water (from 5 % to 30 %) to the above mentioned medium (*i. e.* acetic acid-hydrogen chloride) was therefore studied. However, the presence of water did not appreciably increase the length of time required for complete cleavage.

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Molar Refractions and Parachors of Some Organic Phosphoryl Compounds

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A comparison has been made of the calculated and observed values of the molar refractions and the parachors of some organic phosphoryl compounds. At this institute molar refractions of some phosphoryl compounds have earlier been determined by Holmstedt ¹.

Apparatus and Experiments. The density was determined by a pyknometer and the refractive index in a refractometer of Bellingham and Stanley's design. The surface tension was measured by means of a stalagmometer. The flow velocity of the liquid was regulated so that the number of drops per minute did not exceed fifteen. All determinations were performed at 20° C.

Calculations. The observed molar refraction was obtained from the Lorenz-Lorentz formula $MR = \frac{M(n^2 - 1)}{D(n^2 + 2)}$, and the parachor according to the formula

$$P = \frac{MV\gamma}{D - d}, \text{ where } M = \text{molecular weight,}$$

n = refractive index, γ = surface tension, D = density of the liquid and d = density of the vapour over the liquid (d is here extremely small compared with D and can therefore be ignored).

In Table 1 two series of calculated molar refractions are given. One is based on Jones, Davies and Dyke's ² values for atomic refractions of phosphorus and oxygen, and the other on those of Kabachnik ³. In both series Vogel's ⁴ values were used for the other atomic group refractions, with the exception of the values for chlor-

Table 1. Molar refractions and parachors of some organic phosphoryl compounds

Compound	Density at 20° C	Molar refraction				Parachor		
		n_D^{20}	$MR_{obs.}$	$MR_{calc. a)}$	$MR_{calc. b)}$	γ 20°	$P_{obs.}$	$P_{calc.}$
$(C_2H_5O)_2PO \cdot H$	1.072	1.4075	31.75	31.65	31.47	30.9	607.6	606.3c)
$(i-C_3H_7O)_2PO \cdot H$	0.997	1.4080	41.11	41.00	40.82	26.4	755.5	757.3c)
$(C_2H_5O)_2PO \cdot F$	1.145	1.3719	31.00	31.36	—	25.9	307.6	312.8
$(i-C_3H_7O)_2PO \cdot F$	1.058	1.3825	40.54	40.71	—	24.5	387.3	387.7
$(C_2H_5O)_2PO \cdot Cl$	1.210	1.4177	35.90	36.39	36.18	32.0	339.0	342.0
$(i-C_3H_7O)_2PO \cdot Cl$	1.102	1.4175	45.85	45.74	45.53	28.3	419.9	417.0
$CH_3OPO \cdot Cl_2$	1.493	1.4344	26.01	26.31	25.93	34.9	242.5	244.9
$C_2H_5OPO \cdot Cl_2$	1.381	1.4347	30.78	30.96	30.58	32.8	282.3	283.1
$(CH_3)_2NPO \cdot (OC_2H_5)_2$	1.045	1.4180	43.70	43.57	43.90	30.3	406.6	409.8
$(CH_3)_2NPO \cdot OC_2H_5 \cdot Cl$	1.188	1.4404	38.06	38.13	38.29	34.9	351.1	350.7
$(CH_3)_2NPO \cdot F_2$	1.235	1.3470	22.32	22.63	—	25.1	233.9	233.5
$(CH_3)_2NPO \cdot Cl_2$	1.363	1.4637	32.77	32.69	32.68	36.1	291.3	291.7
$(C_2H_5)_2NPO \cdot Cl_2$	1.253	1.4641	41.83	41.99	41.98	35.7	370.7	371.4
$((CH_3)_2N)_2PO \cdot F$	1.115	1.4267	35.14	34.83	—	33.4	332.3	330.3

a) Jones, Davies and Dyke-Vogel-Holmstedt.

b) Kabachnik-Vogel.

c) Arbuzov and Vinogradova give 607.9 and 751.4.

ine in the Cl-P bond in the series according to Kabachnik³ and the nitrogen in the N-P bond according to Jones, Davies and Dyke². The new chlorine value was calculated by Kabachnik³ and the new nitrogen value (1.71) by Holmstedt¹.

In calculations of the parachors, Gibling's⁵⁻⁸ values with special structure corrections seem to be the most reliable. Other authors who have studied group parachors more recently are Samuel⁹ and Vogel⁴. Arbuzov and Vinogradova¹⁰, using Gibling's method, have shown that the molecules of phosphites are mainly in dimeric form, for which reason a correction ought to be made in the calculation of the parachor (see also Gibling⁶). In alkoxy groups corrections in respect of β -atoms were made except in the case of *iso*-propoxy compounds, where it was found necessary to correct only one of the two β -atoms.

Results. Close agreement was obtained between the calculated and the observed values for both the molar refractions and

the parachors of the phosphoryl compounds studied, as shown in Table 1. Some of the phosphoryl halides, however, are easily hydrolysed by the humidity of the air, which complicated the determinations.

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