

dissociation, into the ditelluride and disulphide, or the corresponding radicals.

Some arylselenium tribromides, ArSeBr_3 , dissociate into bromine and the selenenyl bromide⁶. For the *p*-anisyl telluritri-dithiocarbamates, the tellurenyl dithiocarbamate is, correspondingly, a possible dissociation product. However, these compounds appear to be unstable. Thus, they are not obtainable from *p*-methoxybenzene-tellurenyl methanethiosulphonate⁴ and sodium dithiocarbamates; instead, a mixture of *bis*(*p*-anisyl) ditelluride and the *p*-anisyl telluritri-dithiocarbamate results.

In ethylene dibromide at 20° C *bis*(dimethylthiocarbamyl) disulphide does not obey Beer's law, and thus perhaps dissociates into free radicals⁷. In view of this fact, and recent indications of radical dissociation of aromatic ditellurides⁸, one may inquire whether the reactions of *bis*(thiocarbamyl) disulphides with *bis*(*p*-anisyl) ditelluride take place by radical mechanisms. Qualitative observations have shown that *bis*(2-benzothiazyl) disulphide, for which radical dissociation in hot toluene solutions has been demonstrated by magnetic measurements⁹, reacts with *bis*(*p*-anisyl) ditelluride in the same way as do the *bis*(thiocarbamyl) disulphides. Diphenyl disulphide, hot solutions of which do not obey Beer's law¹⁰, is inactive.

Diphenyl ditelluride⁸, according to preliminary experiments, reacts with *bis*(thiocarbamyl) disulphides to give compounds of the same type, and having analogous thermochromic properties, as does *bis*(*p*-anisyl) ditelluride.

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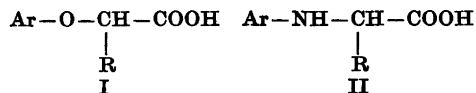
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α -N-Arylamino-carboxylic Acids as Plant Growth-Regulators

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A considerable part of the work on the relations between chemical structure and biological activity of plant growth-regulators has been carried out on α -aryloxyalkylcarboxylic acids (I). A few α -N-arylamino-acids (II) have been investiga-



ted in this respect and at least in one case such an acid was found to be highly active¹ while in another case it was stated that the replacement of the O atom by NH resulted in an inactive compound². Thus our knowledge of the effect of replacing the oxygen bridge by an imino group is very unsatisfactory and this would be ample reason for a more thorough investigation of compounds of the type II. Also from a different point of view more notice should be paid to these amino-acid derivatives. Plant growth-regulators of the type I have not been found to occur in nature, which is very little surprising, as the active members of this series have structures which are far from "natural" looking. However, by replacing the oxygen bridge by an imino group, compounds are obtained,

which are closely related to the most important class of compounds occurring in nature, the α -amino-acids. These, with very few exceptions, belong to the L-series while optically active α -aryloxyalkylcarboxylic acids (I) with higher auxin activities than their respective antipodes most probably belong to the D-series³⁻⁶. A verification of the last statement would be of great value and might be carried out by an application of the method of quasi-racemates to optically active α -aryloxyalkylcarboxylic acids (I) and structurally similar α -N-arylamino-acids (II) prepared from optically active amino-acids with retention of the configuration. Another question which could be answered in connection with such an investigation is if the α -N-arylamino-carboxylic acids (II) show the same stereochemical specificity as do the corresponding oxy-acids of the type I.

Work along these lines is now in progress at this institute and a number of amino-acid derivatives have been prepared, some of which seem not to have been described in the literature before. The plant physiological properties of these compounds will be studied by Dr. B. Åberg who has kindly put some preliminary results at the author's disposal. According to Dr. Åberg α -(2,4-dichloroanilino)-propionic acid and α -(2-naphthylamino)-propionic acid possess auxin activities which are only a little lower than the activities of the corresponding α -aryloxyalkylcarboxylic acids.

Experimental. Optically active α -anilino-propionic acids. The strychnine salt of the racemic acid (m.p. 161—161.5°) was recrystallised several times from dilute ethanol. The pure salt on decomposition yielded the (—)-acid which was recrystallised from dilute ethanol; m.p. 149.5—150.2°. An acid with $[\alpha]_D = +50^\circ$ (in ethanol) was obtained from the mother liquor from the first recrystallisation of the strychnine salt. This product with (+)- α -phenylethylamine yielded a crystalline salt which was recrystallised several times from acetone. From the pure salt the (+)-acid

was obtained. After recrystallisation from dilute ethanol it melted at 149.5—150.4°.

0.1004 g (—)-acid in abs. ethanol to 10.00 ml: $\alpha_D^{25} = -0.627^\circ$. $[\alpha]_D^{25} = -62.5^\circ$; $[M]_D^{25} = -103.2^\circ$.

0.1031 g (+)-acid in abs. ethanol to 10.00 ml: $\alpha_D^{25} = +0.643^\circ$. $[\alpha]_D^{25} = +62.4^\circ$; $[M]_D^{25} = +103.0^\circ$.

Found:

Equiv. wt. 165.0 Calc. for (—)-C₉H₁₁O₂N 165.2
 » » 166.0 » » (+)- » 165.2

α -(2,4-Dichloroanilino)-propionic acid. 2,4-Dichloroaniline (8.1 g) and ethyl α -bromopropionate (4.5 g) were heated at 180° for one hour. The crystalline product was treated with water and the oil which separated was steam distilled with aqueous potassium hydroxide. The residue was acidified with dilute hydrochloric acid against methyl orange when the acid separated. The crude acid (2.5 g) was recrystallised from dilute ethanol yielding 2.2 g of pure acid; m.p. 148—149°.

Found: Equiv. wt. 233.4; N 5.96

Calc. for C₉H₉O₂Cl₂N: Equiv. wt. 234.1; N 5.985.

α -(2,5-Dichloroanilino)-propionic acid. 2,5-Dichloroaniline (8.1 g) and ethyl α -bromopropionate (4.5 g) were treated as above. 2.5 g of acid, recrystallised from dilute ethanol, were collected; m.p. 160.5—162°. Found: Equiv. wt. 234.7; N 5.93. Calc. for C₉H₉O₂Cl₂N: Equiv. wt. 234.1; N 5.985.

α -(3,4-Dichloroanilino)-propionic acid. 3,4-Dichloroaniline (16.2 g) and ethyl α -bromopropionate (9.1 g) were heated at 100° for two hours and at 130—140° for two hours and the product treated as above. After recrystallisation from dilute ethanol 7.8 g were collected; m.p. 145—146.5°. Found: Equiv. wt. 236.2; N 5.94. Calc. for C₉H₉O₂Cl₂N: Equiv. wt. 234.1; N 5.985.

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