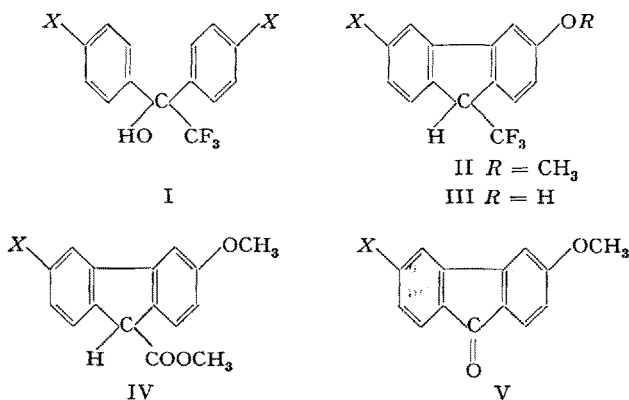


Summary

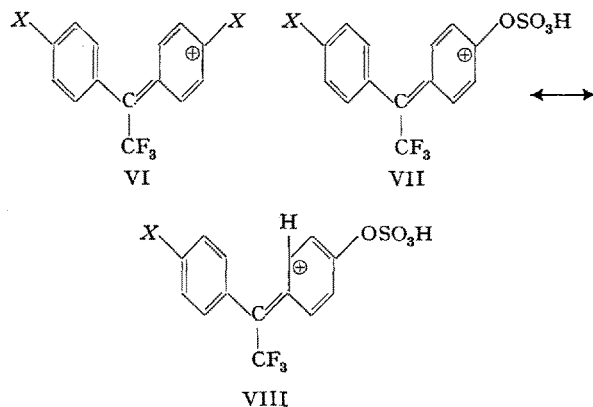
Several compounds belonging to the group of *para*-substituted N-arylglycines have been found to exhibit pronounced tuberculostatic activity *in vitro*, but are too toxic for practical application. The relationship between chemical structure and activity is similar to that observed in the group of thiocarbanilides.

A Cycloisomerization Reaction of Di-(*p*-halogenophenyl)-trifluoromethyl-carbinols

Di-(*p*-halogenophenyl)-trifluoromethyl-carbinols (I, $X = \text{halogen}$)¹ dissolve in concentrated sulphuric acid with an intensely purple colour ($\lambda_{\text{max}} = 570\text{--}580 \text{ m}\mu$) which changes rapidly to orange ($\lambda_{\text{max}} = 495 \text{ m}\mu$); this change is accompanied by formation of the corresponding hydrohalogenic acid, HX . When the orange solution is poured into water, III ($X = \text{halogen}$, $R = \text{H}$; m.p. $192\text{--}193^\circ$) is formed. When methyl alcohol is employed instead of water, the methyl ether II is obtained. In a similar cyclodehydration reaction benzilic acid is converted by aluminium chloride into fluorene-9-carboxylic acid².



The structure of II was proven as follows: the trifluoromethyl group is converted easily by methanolic alkali to a carbomethoxy group (IV; m.p. $129\text{--}130^\circ$). Oxidation of IV with alkaline hydrogen peroxide gave a yellow ketone



¹ E. D. BERGMANN, A. S. TAHORI, A. KALUSZYNER, and S. REUTER, *Nature* **176**, 266 (1955). – A. KALUSZYNER, S. REUTER, and E. D. BERGMANN, *J. Amer. chem. Soc.* **77**, 4146 (1955).

² D. VORLAENDER, *Ber. dtsch. chem. Ges.* **44**, 2467 (1911).

$\text{C}_{14}\text{H}_9\text{ClO}_2$ (m.p. $181\text{--}182^\circ$), which was shown to be 3-methoxy-6-chlorofluorenone (V) by an unambiguous synthesis, starting from 4-chloro-anthranilic acid and anisole.

The following mechanism for the formation of II from I ($X = \text{Cl}$) appears reasonable. In the carbonium ion VI which is formed when I is dissolved in concentrated sulphuric acid, one of the halogen atoms is non-aromatic and reacts with the acid to $\text{VII} \leftrightarrow \text{VIII}$. This is cyclized with elimination of a proton; the product reacts with methanol or water to give II or III, respectively.

S. COHEN and A. KALUSZYNER

Research Laboratories, Medical Corps, Israel Defence Forces, January 22, 1957.

Résumé

Une solution de di-(*p*-chlorophényl)-trifluorométhyl-carbinol dans l'acide sulfurique concentré, diluée à l'eau ou au méthanol, donne naissance à du chloro-3-hydroxy-(ou méthoxy)-6-trifluorométhyl-9 fluorène. Le composé méthoxylé, après l'alcoolyse alcaline du groupement $-\text{CF}_3$, a été dégradé au fluorénone correspondant, dont la synthèse a été réalisée indépendamment.

Quantitative Determination of Bone Minerals from Roentgenograms

Densitometric measurements of radiograms have been much used to estimate the mineral content of bones¹. However, the apparatus required is expensive and complicated and the technique is tedious. Moreover, because the materials which absorb roentgen rays are not randomly distributed, subjective judgement plays an important role in the selection of the areas to be measured. Besides the danger of subjective bias, the uneven distribution of minerals renders the interpretation of the data obtained by density measurements rather difficult, as has been shown in connection with histological sections².

For obviating the distribution error, ORNSTEIN³ described a new photographic method. A specimen to be examined was photographed. The emulsion was developed to produce a γ value = 1. A positive print was then made using a photographic enlarger. The positive image was developed to produce a γ value = 1. The images of individual nuclei were cut out of the film, and the amount of silver per image was determined. ORNSTEIN stated that the use of silver estimation method in film blackening measurements might be at least as accurate as the densitometric scanning methods. Moreover, it is faster and requires fairly simple and inexpensive apparatus.

Theoretically the same method could be expected to apply equally well to quantitative roentgenological studies of bones⁴. ORNSTEIN's method has been modified

¹ W. MC FARLAND, *Science* **119**, 810 (1954).

² D. GLICK, A. ENGSTRÖM, and B. G. MALMSTRÖM, *Science* **114**, 253 (1951). – O. ERÄNKÖ and J. KIHLEBERG, *Quantitative methods in histology and microscopy histochemistry* (S. Karger, Basel and New York; Little, Brown & Co., Boston and Toronto 1955).

³ L. ORNSTEIN, *J. Lab. Invest.* **1**, 250 (1952).

⁴ I am grateful to Prof. O. ERÄNKÖ from the Department of Anatomy, University of Helsinki, for suggesting the use of silver analysis.