From the biochemical point of view, the formation of true peptides in a reaction involving an amino-acylphosphate derivative provides a model of peptide synthesis, the interest of which is due to the fact that acylphosphates are believed to play an important part in peptide-bond formation within the living cell[2-5]. It is also noteworthy that this reaction takes place under physiological conditions of *p*H, temperature and concentrations.

H. Chantrenne
Laboratoire de Morphologie animale,
Faculté des Sciences,
Université de Bruxelles.
April 12.

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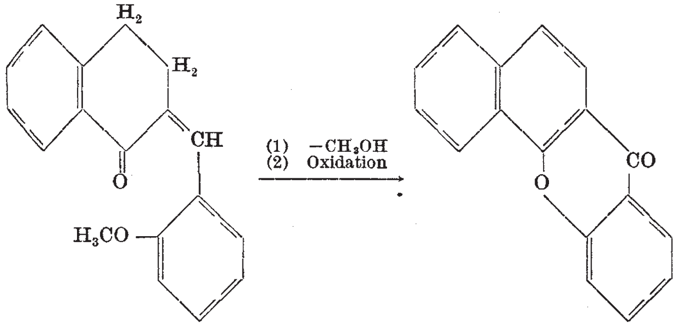
Further Studies on 3 : 4-Benzxanthenes

3 : 4-Benzxanthene was first prepared by Baddar and Gindy, who oxidized it quantitatively and easily to the corresponding ketone[1]. 3 : 4-Benzxanthone, however, has been prepared directly, although in poor yields, by Graebe and Feer[2], von Kostanecki[3], and Knapp[4].

On account of the ease with which 3 : 4-benzxanthene is oxidized to 3 : 4-benzxanthone, it was thought that by carrying out the cyclization under more drastic conditions, oxidation might also be effected. Therefore, a strongly heated mixture of fused potassium hydrogen sulphate and anhydrous sodium sulphate was used to effect the cyclization of 2-(*o*-methoxybenzylidene)-α-tetralone instead of the fused mixture of anhydrous potassium hydrogen sulphate and anhydrous sodium sulphate originally used[1] Under these new conditions, the potassium hydrogen sulphate was completely transformed to the pyrosulphate, which will act as a cyclizing as well as an oxidizing agent. The reaction was then carried out as before; the product separated out from alcohol in lemon-yellow needles, m.p. 147–149°; raised on admixture with an authentic 3 : 4-benzxanthone specimen to 155–158°. This indicated that the product was an impure sample of 3 : 4-benzxanthone.



Many fruitless attempts were made to purify the above sample, by distillation in vacuum, sublimation under reduced pressure, or repeated crystallization (up to eight times) from either alcohol, methyl alcohol, acetic acid or their dilute aqueous solutions, benzene, benzine, chloroform or dioxan. It was only slightly decolorized on heating with freshly activated animal charcoal for fifteen minutes, followed by crystallization, although the melting point was very slightly raised. A dilute solution of the yellowish product in benzene or methyl alcohol was passed through an alumina adsorption column 20 cm. long.

All attempts to purify the substance were unsuccessful. The best results were obtained by treatment with dilute potassium permanganate in aqueous acetone (at room temperature or hot), when most probably its complete oxidation was effected.

This showed, beyond doubt, that the presence of a pyrosulphate radical in the cyclizing mixture influences the oxidation of the molecule to the 3 : 4-benzxanthone. This oxidation is, however, partial; and might be related to the amount of the pyrosulphate present, a fact that accounts for the relatively low yields of the 3 : 4-benzxanthene formerly produced.

The yield of cyclization of 2-(*o*-methoxybenzylidene)-α-tetralone was improved by stirring it with a well-powdered mixture of fused potassium hydrogen sulphate and anhydrous sodium sulphate at 230–235° instead of 260–270° (hence no pyrosulphate is present), then proceeding with the reaction as indicated before (cf. Baddar and Gindy[1]).

Attempts are now being made to prepare substituted 3 : 4-benzxanthenes and dibenzxanthenes and their oxidation products according to the new modification of the reaction.

Munir Gindy
Fouad I University,
Abbassia, Cairo.

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Distinction of Vermiculite, Chlorite and Montmorillonite in Clays

The frequency with which vermiculitic and chloritic minerals as well as montmorillonites probably occur in soil-clays makes it necessary to have a clear-cut method for distinguishing them. The similarity of their X-ray powder diffraction patterns renders certain identification practically impossible without some prior treatment of the clay, especially if more than one of them is present in a given sample. Identification can, however, be made relatively easy by observing the variation in the position of the strong basal line, which normally occurs at about 14 A. on the diffraction patterns of all three minerals, after various treatments.

Montmorillonite is most simply identified by means of the well-known glycerol technique, in which the first-order basal line is displaced to 17·7 A. [1]; and the persistence of a 14 A. line after this treatment indicates vermiculite or chlorite or both. Heating at 500° C. for a number of hours, followed by immediate sealing of the sample (to prevent rehydration) into a glass tube in which it can be photographed, causes the (001) line of montmorillonite to shift to 9–10 A., and the 14 A. vermiculite line behaves similarly. The persistence of a 14 A. line after this treatment is therefore strongly indicative of chlorite. Vermiculite can be positively identified by leaching with a solution of an ammonium salt, which causes