No evidence for the acetylation of VI was obtainable, using acetic anhydride in pyridine or in glacial acetic acid. Also V was unacetylated by treatment with acetic anhydride and sodium acetate at 100°.

Summary

Ethylacetonylbarbituric acid may be made in good yields from sodium ethylbarbiturate and chloroacetone in the presence of a little sodium iodide. Several cyclic acetals were prepared by reaction of ethylacetonylbarbituric acid with glycols, including a nitro glycol. The nitro acetal was hydrogenated to an amino acetal, and the latter was acetylated with ketene to an acetamido acetal. Pharmacological toxicity data and anticonvulsant tests are included.

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NOTES

Amide Vinylogs

BY ROBERT H. BAKER AND ARTHUR H. SCHLESINGER[1]

In a survey of the behavior of ethoxymethylenediketones and esters as alkylating agents toward amines, amides, the Grignard reagent and in Friedel–Crafts and other type reactions some new compounds have been encountered and are described below.[2]

Ethoxymethyleneacetoacetic ester reacts readily with aminoacetic ester and with progressive difficulty with *p*-aminobenzoic ester and urethan to produce open chain amide vinylogs which are cleaved by hydrogen (PtO_2, 2 atm., 25°) as are derivatives of typical amines.[3] Thiourea reacts to form the mercaptopyrimidine similar to the cyclization product of the urea derivatives.[3]

Experimental[4]

Ethyl α-(N-Carbethoxyaminomethylene)-acetoacetate.—Equimolar quantities of ethyl ethoxymethyleneacetoacetate and ethyl carbamate were heated at 143–165° for 1.7 hours and then cooled at 0° for three hours to induce crystallization. Three crystallizations from cyclohexane, employing activated alumina as decolorizing agent, produced yellow needles, m. p. 40.5–41.0°; 13% yield.

Anal. Calcd. for $C_{10}H_{15}NO_5$: C, 52.3; H, 6.55; N, 6.11. Found: C, 52.4; H, 6.90; N, 6.10.

Ethyl α-(*p*-Carbethoxyanilinomethylene)-acetoacetate.—This was produced similar to the above from ethyl *p*-aminobenzoate at 110–135° for one hour. It was decolorized in hot ethanol solution by alumina. Five crystallizations from ethanol, then from cyclohexane and finally ethanol gave colorless crystals, m. p. 105°, 70% yield.

Anal. Calcd. for $C_{16}H_{19}NO_5$: C, 63.0; H, 6.26; N, 4.60. Found: C, 63.2; H, 6.50; N, 4.50.

Ethyl α-(N-Carbethoxymethylaminomethylene)-acetoacetate.—Slow addition of freshly distilled glycine ethyl ester to an equivalent of the ethoxymethylene compound at 0° produced a vigorous reaction, and the contents of the reaction flask were solid within thirty minutes. Two crystallizations from 70% ethanol gave matted colorless needles, m. p. 71.0–71.5°; 66% yield.

Anal. Calcd. for $C_{11}H_{17}NO_5$: C, 54.4; H, 7.00; N, 5.76. Found: C, 55.2; H, 7.15; N, 5.58.

Ethyl 2-Mercapto-4-methylpyrimidine-5-carboxylate.—Thiourea and an equivalent of the ester vinylog were heated at 150° for thirty minutes. The mixture frothed vigorously and a hard, red solid was obtained which was purified by digestion on the steam-bath with ethanol. The liquors upon chilling gave a red powder which was treated three more times in a similar manner. The red product, 52% yield, failed to melt but sintered at 160° and decomposed. Sublimation *in vacuo* failed to improve its appearance. It is soluble in 10% sodium hydroxide solution and decolorizes iodine.

Anal. Calcd. for $C_6H_{10}N_2O_2S$: N, 14.10. Found: N, 13.94.

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(1) Allied Chemical and Dye Corporation Fellow, 1946–1947.

(2) Except toward amines the results were largely of a negative nature and cannot be published here, *cf.* A. H. S., Ph.D. Thesis, 1947.

(3) Baker and Schlesinger, THIS JOURNAL, 68, 2009 (1946).

(4) Microanalyses by Patricia Craig and Nelda Mold.

Some Quaternary Ammonium Salts of Substituted Thiazoles

BY CARL T. BAHNER, DONALD PICKENS[1] AND DOROTHY BETTIS BALES[2]

The biological results obtained by Shear and associates[3] at the National Cancer Institute using quaternary salts derived from pyridine and its homologs and benzologs have led us to prepare similar quaternary salts containing the thiazole ring. Particular interest attaches to this series in view of the fact that thiamin chloride is a quaternary salt containing this ring. The substituted thiazoles which we have used are 4-methyl-2-β-hydroxyethylthiazole, 2,4-dimethylthiazole, 2-ethyl-4-methylthiazole, 4-methylthiazole, benzothiazole, and 2-methylbenzothiazole. These have been caused to react with phenacyl and substituted phenacyl bromides and with phenylethyl and cyclohexylethyl halides. Most of these bases reacted with the phenacyl bromides readily upon

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(3) Shear, *et al.*, in "Approaches to Cancer Chemotherapy," American Association for the Advancement of Science, F. R. Moulton, Editor, Washington, D. C., 1947, p. 236 ff.; Hartwell and Kornberg, THIS JOURNAL, 68, 1131 (1946).