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The treatment of acetoacetic esters with concentrated ammonia has been found to produce a number of products. One of these, isolated in as high as 15 percent has been tentatively identified as 2, 4-dimethyl-6-hydroxynicotinamide (I). This compound has not been previously characterized although unidentified compounds have been reported which may have been 2, 4-dimethyl-6-hydroxynicotinamide. Chick and Wilsmore (1910) report that an unidentified compound having the same elementary analysis as an ammonia complex of (I) results when diketene is treated with ammonia and subsequently heated to dryness. Claisen and Meyer (1902) report the isolation of a similar unidentified compound from the heating of acetoacetamide. Duisberg (1882) treated ethyl acetoacetate with aqueous ammonia to produce what apparently was acetocetamide. Upon heating the latter compound he isolated another substance melting at 280°C. and identified only as C_4H_5NO. This was very likely an impure form of (I)

The free acid of (I) is known and has been independently synthesized in these laboratories from the hydrochloride of betaminocrotonic ester by the method of Collie (1897) and from isodehydroacetic acid by the method of Nieme and Pechmann (1890). Attempts at converting the free acid to the amide (I) by the usual procedures have all failed, apparently because of steric effects.

Compound (I) melts at 330°C., and except for sparing solubility in hot water and hot methanol, is insoluble in the common solvents.

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It is exceedingly resistant to the action of strong acids, strong bases, and reducing agents, but is phenolic and sensitive to oxidizing agents. It is readily brominated to a monobromide. Elementary analyses, molecular weight determinations, and Infra red spectra of compound (I) as well as of the following derivatives substantiate the proposed structure: 2, 4-dimethyl-5-bromo-6-hydroxynicotinamide (II) produced by direct bromination of (I); 2, 4-dimethyl-6-chloronicotinonitrile (III) produced by the action of $POCl_3$ on (I); and the zinc dust reduction product, 2, 4-dimethylnicotinamide (IV). 2, 4-lutidine (V) has been identified by gas chromatography as the principal volatile zinc dust reduction product. A second compound, as yet uncharacterized, resulting from the treatment of compound (I) with $POCl_3$ is identical to the product of the reaction of $POCl_3$ on 2, 4-dimethyl-6-hydroxynicotinonitrile (VI) which was prepared from diacetonitrile by the method of Moir (1902).

Additional work now in progress is expected to constitute an unequivocal structure proof of compound (I). If deductions presented to date are correct, the treatment of beta-keto esters with ammonia shows some promise as a relatively simple method for the synthesis of a number of new derivatives of nicotinic acid.

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