PHOTOCHEMICAL SYNTHESIS OF HETEROCYCLIC SYSTEMS WITH ANILIDES: OXIDATIVE AND NON-OXIDATIVE PHOTOCYCLIZATION REACTIONS

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As part of broadly based studies of synthetic photoreactions of carbonyl derivatives, we have recently explored reactions of the excited states of aromatic amides. The present paper briefly reviews the photocyclization reactions of anilides as an synthetic approach to various condensed heteroaromatic systems.

(1) Benzanilides with various substituents on the acid or anilino group were irradiated to give quinolones, and the effects of the substituents on the efficiency of the oxidative photocyclization were discussed including a special extrusion of an *o*-methoxy group.

(2) N-Benzoyl derivatives of α- and γ-aminopyridines undergo largely oxidative photocyclization in preference to the competing rearrangement.

(3) Anilides of π-excessive five-membered heterocyclic acids, such as thiophen, furan, pyrrole, benzothiophen and indole, readily undergo oxidative photocyclization giving rise to a variety of heterocyclic quinolones.

(4) Photocyclization of benzo[b]thiophene-2-carboxy-N-methylanilide yielded 1-benzothiophene-[2,3-c]-*trans*-14,15-dihydro-5-methylquinolin-6-one, while the lower homologous anilide gave the *cis* isomer by two distinct mechanisms. Such a non-oxidative photocyclization may open a new route to otherwise unaccessible type of heterocyclic compounds.