PHOTOCHEMISTRY OF THE NITROGEN-CONTAINING THIOCARBONYL SYSTEM

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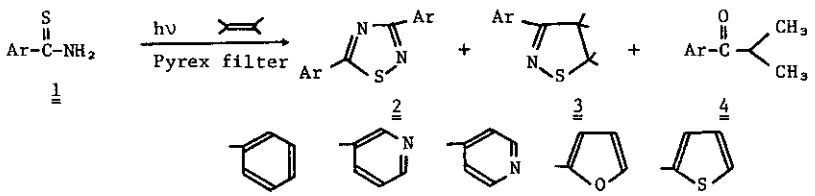
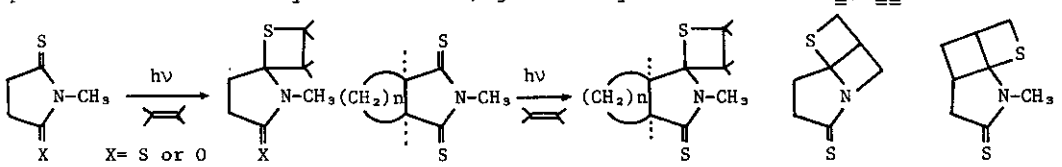
In recent years considerable interest has been showed in the photochemistry of thiocarbonyl systems. In regard to the photoreactions of nitrogen-containing thiocarbonyl systems, however, only few reports have been published. Now, we wish to report the photoreactions of thioamide and thioimide derivatives with various olefins.

Photoreaction of thioamide derivatives 1 with 2,3-dimethyl-2-butene under aerobic conditions gave 1,2,4-thiadiazole derivatives 2, 2-isothiazoline derivatives 3, and ketone derivatives 4, whereas, compounds 2 and 3 were not obtained by the reactions under nitrogen atmosphere.



1 2 3 4

Irradiation of series of cyclic thioimides 5 in the presence of olefins afforded the corresponding thietanes 6 in good yields. Furthermore, irradiation of 7, a dithiosuccinimide with α, α′-disubstituents on the imide ring, gave only the thietane derivatives 8, but the α-cleavaged products were not isolated. In the intramolecular counterpart, a dithiosuccinimide with an olefinic group at the α-position or the N-alkyl side chain, gave tricyclic thietanes 9, 10.



5 6 7 8 9 10