HETEROCYCLES, Vol 24, No 1, 1986

SYNTHESES OF HETEROCYCLES BY PHOTOREACTION OF THE NITROGEN-THIOCARBONYL SYSTEMS

Kazuaki Oda and Minoru Machida
Faculty of Pharmaceutical Sciences, Higashi-Nippon-Gakuen University,
Ishikari-Tobetsu, Hokkado 061-02, Japan
Yuichi Kanaoka
Faculty of Pharmaceutical Sciences, Hokkaido University, Sapporo 060, Japan

General photochemical behavior of cyclic thioimides, a nitrogen-thiocarbonyl system, was studied. It was found that certain thioimides were inert, formally to the Norrish type I and type II processes, one representative photoreaction of the parent imide system. Further we have initiated a broadly targeted study of the photochemical behavior of aromatic and aliphatic thioimides possessing aralkyl group in their side chains.

The irradiation of a series of N-ω-phenylalkyl-thio and dithiophthalimides 1 results in the formation of products 2-4 which are expected from the type II cyclization initiated by δ- or ε-hydrogen abstraction. It is noteworthy that the γ-hydrogen definitely reactive in the ketones is inert in the thioimide system. Similar irradiation of the analogous thiosuccinimides 5 gave two cyclized products, isomeric pyrrolizidinethiols 6, 7. Thus, these results demonstrate that cyclic thioimides undergo the Norrish type II cyclization at least if a benzylic hydrogen is available at the δ- or ε- position of the thiocarbonyl group.