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N-HYDROXYMETHYLATION OF PHTHALIMIDES BY TITANIUM DIOXIDE PHOTOCATALYST IN METHANOL

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Heterogeneous photocatalysis is an emerging technology and is very important for organic synthesis as well as for enviromental purification. Titanium dioxide is a highly-stable photoactive semiconductor material that has been applied to the photoreactions of phthalimides using UV light. It was found that irradiation of a methanol solution of phthalimide and titanium dioxide gave the novel product, *N*-hydroxymethyl-3-hydroxyphthalimidine as the final product in good yield, along with trace amount of 3-hydroxyphthalimidine and *N*-hydroxymethylphthalimide. Irradiation of some derivatives such as 4-methyl, 4,5-dichloro, and 2,3-naphthalenedicarboxyimide and titanium dioxide in methanol gave the same type of photoproducts. However, irradiation of *N*-methyl and *N*-phenyl phthalimides in methanol gave only 3-hydroxyphthalimidine derivatives. In the case of 4-aminophthalimide, maleimide, succinimide and *cis*-1,2,3,6-tetrahydrophthalimide, *N*-hydroxymethyl compounds were produced as the major products.

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