Photochemistry of alkenes and carbonyl compounds has been investigated very widely and in great depth\textsuperscript{1-3}. In comparison, the corresponding nitrogenous chromophores, such as imines and amides, have received less thorough attention. Nevertheless, some surprising trends have come to light. For example, nitrogen occupies a position in-between carbon and oxygen in the periodic table but imines, in general, fail to exhibit photoreactions characteristic of either alkenes or aldehydes and ketones. Particularly intriguing is the lack of hydrogen abstraction reactivity which is so common in the excited states of carbonyl compounds. This reaction has been demonstrated even with an alkene\textsuperscript{4,5}. Irradiation\textsuperscript{4-3} of compound 3, like the ketone\textsuperscript{6-8} 1, was found to give adducts, 4 and 5, arising out of an intermediate formed by intramolecular hydrogen transfer.

\[
\text{hv} \quad \ \text{1} \quad \rightarrow \quad \text{[OH} \ \text{+ OH]} 
\]

\[
\begin{align*}
\text{H}_2\text{C} & \quad \text{O} \\
\text{1} & \quad \rightarrow \\
\text{hv} & \quad \begin{cases} \\
\text{[OH} & \quad \text{+ OH}] \\
\end{cases}
\end{align*}
\]
In aldehydes and ketones the replacement of an α-carbon with oxygen leads to esters. In their photochemical reactions esters resemble aldehydes and ketones in certain ways, such as α and β cleavages, but do not show equal proclivity for the hydrogen abstraction. Replacement of the α-carbon in aldehydes and ketones by nitrogen gives amides. Amides also undergo α and β cleavage but the hydrogen abstraction is further depressed. In fact, it is rarely observed and that too with very poor efficiency.\textsuperscript{9-11}
Thus it may be inferred that many aspects, having theoretical interest as well as synthetic potential, of the photochemistry of nitrogenous chromophores need to be explored. In this context, light induced reactions of the undergiven three types of substrates have been investigated in the present work. The results are discussed in detail in the following chapters.

I

\[
\text{R = } \text{CHO, COCH}_3, \text{C}_6\text{H}_5, \text{H, CH}_3, \text{ClCH}_3, \text{C(CH}_3)_3
\]

II

III

\[
\text{R = CHO, COCH}_3
\]
REFERENCES


