Indicate how A and B can be used to synthesize C, an intermediate in the DeClercq-Vandewalle synthesis of racemic damsin.

M. Vandewalle & P. DeClercq JOC, 42, 3447 (1977)

[a] Formulate a mechanism to account for the following transformation. Be certain to make a model of A so that you can determine which bonds/orbitals are aligned to facilitate rearrangement.

[b] How could the starting material be synthesized?

Consider the following scheme:

\[
\begin{align*}
S_0 & \xrightarrow{h\nu} S_1 \\
S_1 & \xrightarrow{k_f} S_0 + h\nu \\
S_1 & \xrightarrow{k_{IC}} S_0 \\
S_1 & \xrightarrow{k_{ISC}} T_1
\end{align*}
\]

rate of absorbance = \( I_{abs} \) (in units of mE/time)

\[
\frac{d[S_1]}{dt} = I_{abs} - \frac{I_{abs}}{(k_f + k_{IC} + k_{ISC})}
\]

Apply the steady state condition upon \( S_1 \) to show that

\[
(S_1) = \frac{I_{abs}}{(k_f + k_{IC} + k_{ISC})}
\]

rate of formation of \( S_1 \) divided by the sum of the rate constants leading from \( S_1 \) (depleting it)