Synthesis and Photochemistry of Three Spirocyclic Ketones

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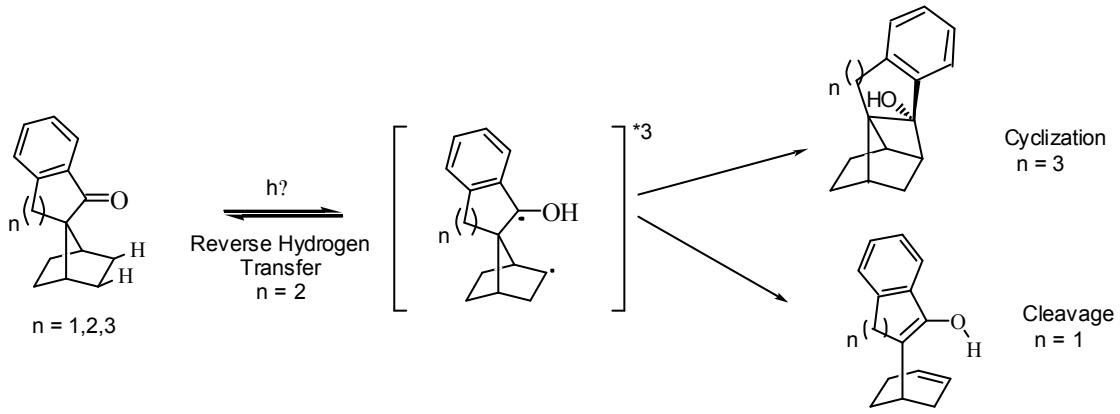
The Norrish/Yang reaction, involving ?-hydrogen abstraction by a ketone, is one of the most widely studied photochemical reactions. When photolyzed, the series of spirocyclic ketones (Scheme 1) undergo ?-hydrogen abstraction from the triplet state, forming a 1,4-hydroxybiradical. This is followed by one of three possible reactions: the Norrish Type II cleavage reaction, Yang photocyclization to form a cyclobutanol, or reverse hydrogen transfer reforming the starting material.



Scheme 1

Through the use of X-ray crystallography and molecular mechanics calculations, correlation between changes in the ketone geometry of the spirocyclic ring system and observed reactivity have been determined.