Exercises, Photochemistry 2021

May 26, 2021

Photochemistry of carbonyl compounds

1. Draw the structures of photoproducts in the following reactions and explain how they are formed:





*J. Am. Chem. Soc*. **1971**, *93*, 7213;

*J. Am. Chem. Soc*. **1969**, *91*, 4437.

2. Suggest the reaction mechanism for the formation of photoproducts in the following reactions:



*J. Org. Chem.* **1975**, *40*, 817.



*J.Am. Chem. Soc.* **1970**, *92*, 4349;

*J. Am. Chem. Soc.* **1973**, *95*, 3947.

3. Upon irradiation of 2-propylquinoline Norrish –type II reaction takes place. Draw the stuctures of anticipated photoproducts and explain how they are formed.



*J. Am. Chem. Soc.* **1969**, *91*, 3103.

4. In the following reactions α,β-diketone abstracts hydrogen. Draw the structures of anticipated hydrogen abstraction photoproducts and explain how they are formed.





5. Explain the reaction mechanism in the following photochemical reactions:





6. Irradiation of 2-methylacetophenone and maleic anhydride gives photoproduct in high isolable yield. Explain the reaction mechanism.



7. Draw the structure of photoproduct in the following photochemical reaction of a phthalimide and explain how it is formed.



8. Explain the reaction mechanism giving the shown photoproducts.



*J. Am. Chem. Soc*. **1978**, *100*, 4504.



*J. Am. Chem. Soc*. **1965**, 87, 1138.

*J. Am. Chem. Soc*. **1967**, *89*, 2033.

*J. Am. Chem. Soc*. **1969**, *91*, 879.



*J. Am. Chem. Soc*. **1986**, *108*, 6276.

*J. Org. Chem.* **1987**, *52*, 1549.



*Tetrahedron Lett.* **1988**, *29*, 1103.

9. Draw the structure of anticipated photoproduct and explain how it is formed.



10. Draw the structures of photoproducts in the following photochemical reaction sequence.



*J. Org. Chem.* **1968**, *33*, 2774;

*J. Chem. Soc. Chem. Commun.* **1966**, 813.

11. Draw the structure of the most probable photochemical product in the following reaction and explain how it is formed.



12. In, Instead of a ketone or an aldehyde benzoate esters with electron withdrawing substituents can also undergo Paterno-Büchi reactions Draw the structure of photoproduct and explain how it is formed.

