

CSO 203

Tutorial 1

1. Compare and contrast the electronic configurations, magnetic properties, and reactivities of $^3\text{O}_2$ and $^1\text{O}_2$.
2. Why is it necessary to use photosensitizers or high-energy methods to generate singlet oxygen?
3. Explain why singlet oxygen reacts readily with organic substrates, while triplet oxygen often requires catalysts (e.g., transition metals) to react.
4. Describe two different methods for generating $^1\text{O}_2$ in the lab.
5. How can singlet oxygen be detected spectroscopically? What is the characteristic phosphorescence wavelength of $^1\text{O}_2$?
6. Name a reaction in which singlet oxygen reacts with an alkene and describe the product.
7. What are the chemical quenchers of $^1\text{O}_2$?