

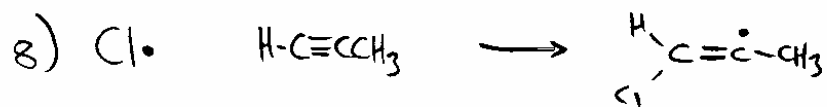
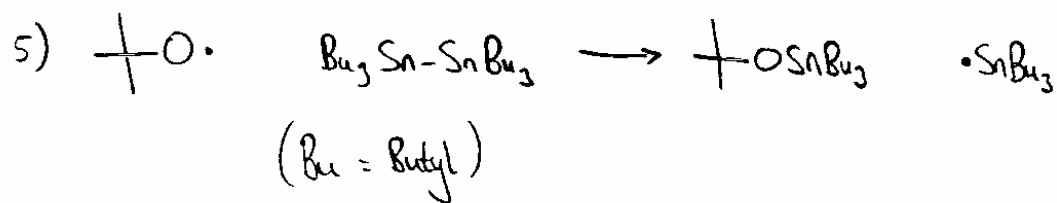
TWQ 1 (25points)

Name _____

1) What is a free radical species?

2-3) Radicals are very reactive and undergo 5 basic reactions. Addition, Fragmentation and Abstraction are three types, what are the other two types of reaction?

4-8) Identify each reaction as an ADDITION, FRAGMENTATION or ABSTRACTION.



9-10) Write a chemical equation showing a reaction that strongly implies that carbon centered radicals are planar (or quickly inverting shallow pyramidal) structures.

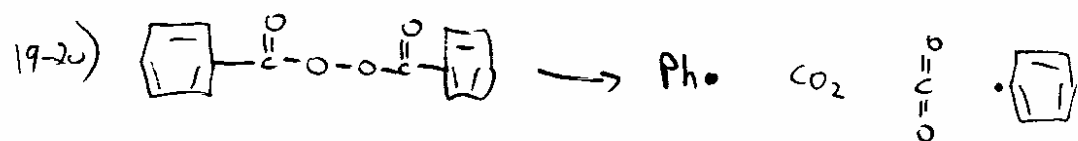
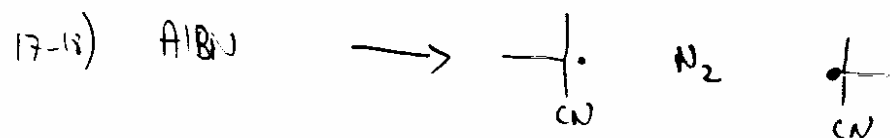
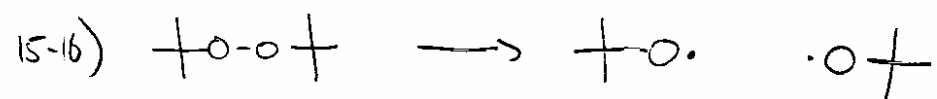
11) What is meant by a FREE RADICAL INITIATOR?

12) what is meant by a FREE RADICAL INHIBITOR?

13) Why are special measures taken to remove air from almost all radical reactions?

14) Name one gas commonly used as an inert atmosphere for radical reactions.

15-20) Write the mechanism for the following three processes.



21-24) Write the mechanism for the interaction of a free radical initiator, tributyl tin hydride and alkyl bromide, which results in the formation of the corresponding alkyl radical.

25) Draw a Lewis structure of a radical species that you believe would have an unusually high stability, and a significantly long lifetime.

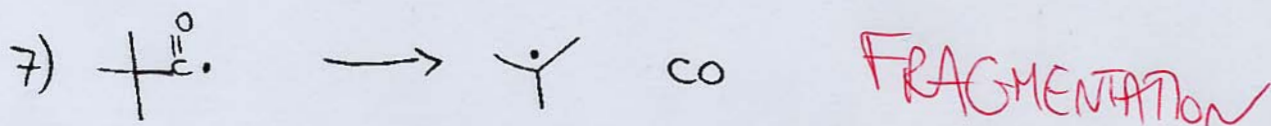
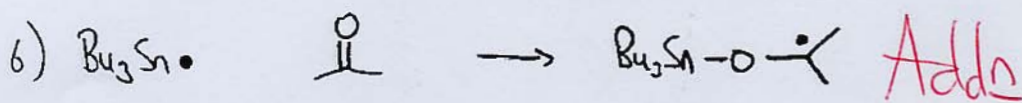
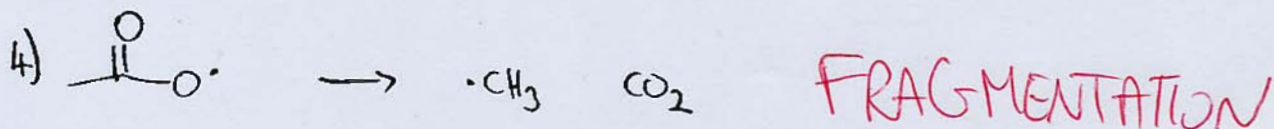
1) What is a free radical species?

A species with an odd number of electrons (resulting in an unpaired electron.)

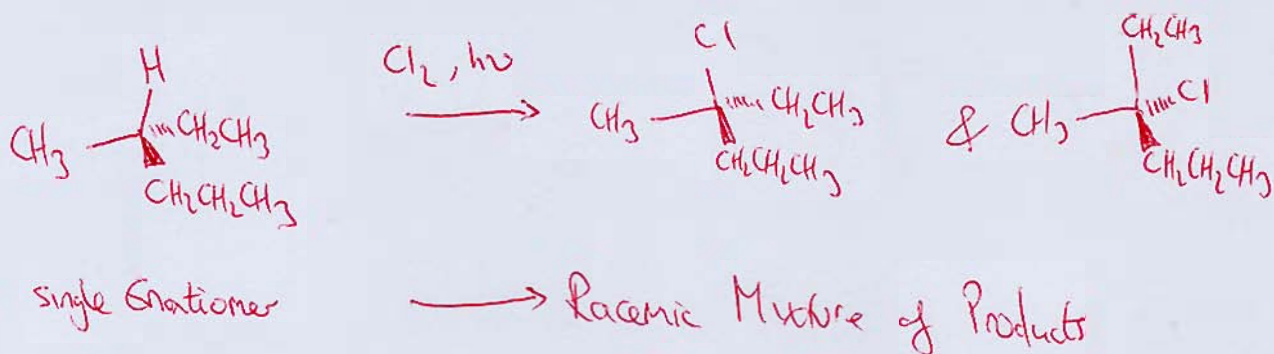
2-3) Radicals are very reactive and undergo 5 basic reactions. Addition, Fragmentation and Abstraction are three types, what are the other two types of reaction?

Disproportionation & Dimerization

4-8) Identify each reaction as an ADDITION, FRAGMENTATION or ABSTRACTION.



9-10) Write a chemical equation showing a reaction that strongly implies that carbon centered radicals are planar (or quickly inverting shallow pyramidal) structures.



11) What is meant by a FREE RADICAL INITIATOR?

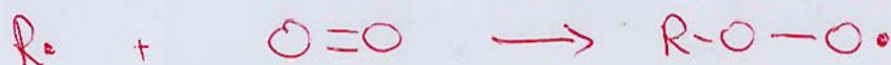
A compound that reacts to generate radicals.

12) what is meant by a FREE RADICAL INHIBITOR?

A compound that reacts with radicals and prevents them from undergoing further productive radical reactions.

13) Why are special measures taken to remove air from almost all radical reactions?

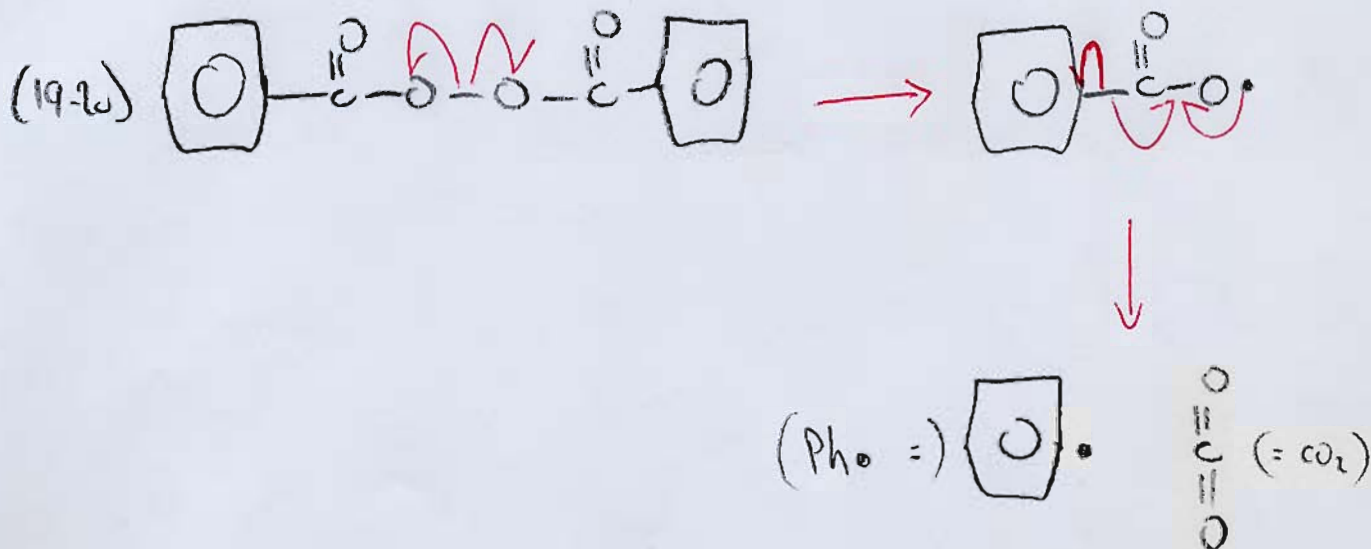
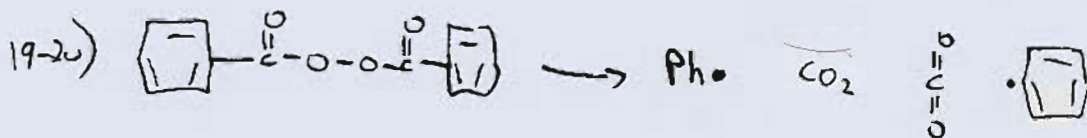
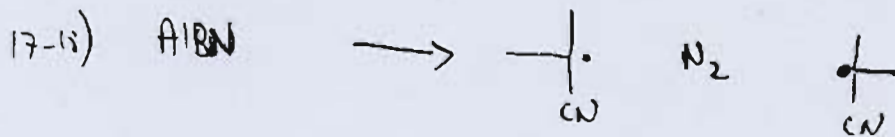
The O_2 in air is a free radical inhibitor.



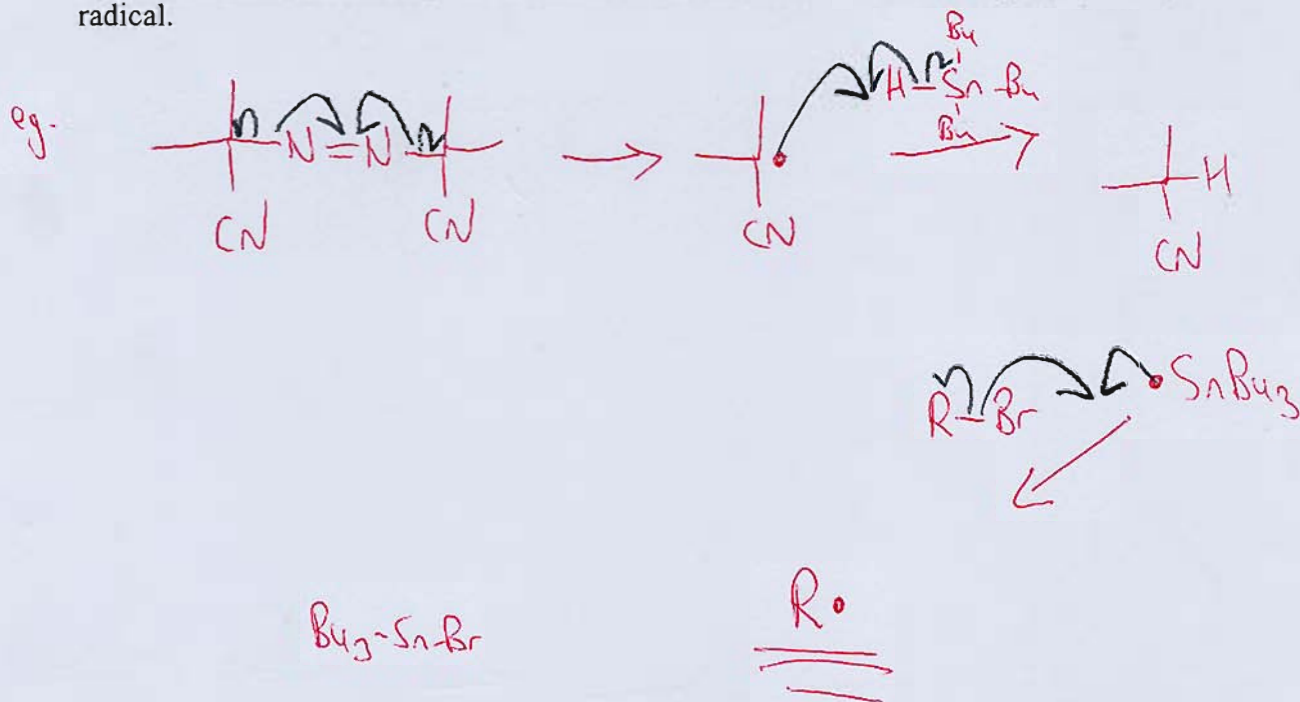
14) Name one gas commonly used as an inert atmosphere for radical reactions.

Nitrogen or Argon are the two most common.

15-20) Write the mechanism for the following three processes.



21-24) Write the mechanism for the interaction of a free radical initiator, tributyl tin hydride and alkyl bromide, which results in the formation of the corresponding alkyl radical.



25) Draw a Lewis structure of a radical species that you believe would have an unusually high stability, and a significantly long lifetime.

See Page 5, Chapter 1 of Notes.