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1. Problem 12.12e

Select the compound(s) below that you would expect to be formed from the reaction of propyllithium,

CH₃CH₂CH₂Li, with OD

- a. CH₃CH₂D
- b. CH₃COLi
- c. CH₃CH₂Li
- d. CH₃CH₂CH₃
- e. CH₃CH₂CH₂D
- f. CH₃CO₂Li

Answer:

2. Problem 12.14a

Select the oxidizing or reducing agent(s) that you would use to carry out the transformation below.



- a. NaBH₄
- b. i. LiAlH₄; ii. H₃O⁺
- c. H₂, Pd/CaSO₄, quinoline
- d. Na, NH₃
- e. i. KMnO₄, H₂O, NaOH, heat; ii. H₃O⁺
- f. H₂, Ni
- g. PCC
- h. i. O₃, CH₃OH ii. (CH₃)₂S
- i. RCO₃H

Answer:

3. Problem 12.14b

Select the oxidizing or reducing agent(s) that you would use to carry out the transformation below.



- a. H₂, Pd/CaSO₄, quinoline
- b. Na, NH₃
- c. i. KMnO₄, H₂O, KOH, heat; ii. H₃O⁺
- d. i. LiAlH₄; ii. H₃O⁺
- e. NaBH₄
- f. H₂, Pd
- g. PCC
- h. i. O₃, CH₃OH ii. (CH₃)₂S
- i. RCO₃H

Answer:

4. Problem 12.14e

Select the oxidizing or reducing agent(s) that you would use to carry out the transformation below.



- a. PCC
- b. i. KMnO₄, H₂O, NaOH, heat; ii. H₃O⁺
- c. i. LiAlH₄; ii. H₃O⁺
- d. O₃, CH₃OH ii. (CH₃)₂S
- e. RCO₃H
- f. H₂, Pd/CaSO₄, quinoline
- g. NaBH₄
- h. H₂, Pt
- i. Li, NH₃

Answer:	

5. Problem 12.17

Predict the organic product from each of the following oxidation reactions. (a)



(b)



(c)



6. Problem 12.18

Predict the organic product from each of the following oxidation reactions. (If there is no product, draw the reactant)



7. Problem 12.11e

What organic product would you expect from the reaction of ethylmagnesium bromide (CH_3CH_2MgBr) with the following reagent.

8. Problem 12.11g

What organic products would you expect from the reaction of ethylmagnesium bromide (CH_3CH_2MgBr) with the following reagent.

$$H$$
, then H_3O^+

Alcohol product:

Hydrocarbon product:

9. Problem 12.13h

What organic product would be formed from the reaction of 1-bromo-2-methylpropane (isobutyl bromide), $(CH_3)_2CHCH_2Br$, with Mg, Et_2O , then H_2C-CH_2 , then H_3O^+ ?

10. Problem 12.24

Propose a reasonable and detailed mechanism for the following transformation.



Choose the correct mechanism for step one of this reaction.



Answer:

Write the mechanism for step two of this reaction. Show lone pairs and formal charges.

Choose the correct mechanism for step three of this reaction.



Write the mechanism for step four of this reaction. Show lone pairs and formal charges. Use two molecules of H_3O^+ as the acids for this double protonation step. Show only one water molecule in the product of this mechanism. Draw out only one hydrogen on each H_3O^+ .

11. Problem 13.19

What product would you expect from the following reaction?



12. Problem 13.20a

Draw the product that you would expect to be formed when 1 mol of 1,3-but adiene is heated with 1 mol $\mbox{Cl}_2.$

13. Problem 13.20b

Draw one product that you would expect from the reaction of 1 mol of 1,3-butadiene and 2 mol of Cl₂.

14. Problem 13.30

Predict the products of the following reactions.

(a)



Product:



Major Product:

Minor Product:



Major Product:

Minor Product:

15. Problem 13.20d

Draw one product that you would expect from the reaction of 1 mol of 1,3-butadiene and 2 mol of $\rm H_2,$ Ni?

16. Problem 13.40

Give the structures of the products that would be formed when 1,3-butadiene reacts with each of the following:





17. Problem 13.44d

Which diene and dienophile would you employ in a synthesis of the molecule below?



Diene:

Dienophile: