Week 8 Worksheet

Objectives:

Chapter 12
➢ Distinguished between Oxidation and Reduction reactions
➢ Predict products for the following reactions:
  ○ Alkyne reduction with either H₂/Lindlar’s Catalyst or Na/NH₃ (l)
  ○ Reduction of alkyl halides and epoxides with LiAlH₄
  ○ Oxidation of alkenes with peroxyacids like mCPBA to form epoxides
  ○ Dihydroxylation with KMnO₄ of an alkene to form syn-products
  ○ Ozonolysis with O₃, followed by an oxidative or reductive workup, to form aldehydes, ketones, or carboxylic acids
  ○ Alcohol oxidation with either CrO₃/H₂SO₄ or PCC to form carboxylic acids, aldehydes, or ketones
➢ Utilization of known reactions for the synthesis of novel compounds

Problem Set:

1. Draw the product(s) of the following reactions.

   a. [Diagram of cyclohexene with KMnO₄ and KOH/H₂O reactions]

   1. KMnO₄
   2. KOH, H₂O

   b. [Diagram of cyclohexene with mCPBA, LiAlH₄, and H₂O reactions]

   1. mCPBA
   2. LiAlH₄
   3. H₂O
2. Draw the product(s) formed in each oxidative cleavage.

a. \[ \text{Product} \]

b. \[ \text{Product} \]

3. Devise a synthesis of the following compound using ethanol as the only source of carbon. You may use any other needed inorganic reagents.

\[ \text{Ethanol} \rightarrow \text{Product} \]