Week 8 Worksheet

Topics Covered
- Reduction of alkenes and alkynes
- Reduction of alkyl halides
- Syn- and anti-dihydroxylation
- Ozonolysis

1. (Klein 12.14) Draw the expected product for each of the following reactions.

a) \[ \text{H}_2 \text{(excess)} \rightarrow \text{Pd/C} \]

b) \[ \text{H}_2 \rightarrow \text{Lindlar’s Catalyst} \]

c) \[ \text{Na, NH}_3 \]

d) \[ \text{H}_2 \rightarrow \text{Lindlar’s Catalyst} \]

e) \[ \text{Na, NH}_3 \]

Answer:
2. Draw a stepwise mechanism for the following reaction.

\[
\begin{align*}
\text{Br} & \quad \text{LiAlH}_4 \\
\text{\text{C}} & \quad \text{\text{C}} \\
\rightarrow & \quad \text{\text{C}} \quad \text{\text{C}}
\end{align*}
\]

Answer:

\[
\begin{align*}
\text{Br} & \quad \text{LiAlH}_4 \\
\text{\text{C}} & \quad \text{\text{C}} \\
\rightarrow & \quad \text{\text{C}} \quad \text{\text{C}}
\end{align*}
\]
3. Create a multi-step synthesis to convert the starting material on the left to the product on the right.

![Chemical structures](image)

Answer:

![Chemical structures](image)

4. (Klein 11.106) Predict the product and draw an arrow-pushing mechanism for the following reaction.
5. (Klein 11.116) For each of the following reactions, fill in the box with the major product(s).
6. Propose a synthesis for the product from the starting material given below.