1. Provide pKa's for the following compounds. Arrange them on a number line according to their pK\textsubscript{a}.

\[
\begin{array}{cccccccc}
\text{CH}_4 & \text{H}_3\text{C}=\text{O} & \text{H}_3\text{C}-\text{OH} & \text{H}_2\text{O}^+ & \text{H}_3\text{C}=\equiv\text{H} & \text{NH}_3 & \text{H}_2\text{SO}_4 & \text{HCl} \\
\end{array}
\]

2. Assign the absolute configuration of the following compounds:

3. Fill in the periodic table with the missing elements.
4. Fill in the boxes with the appropriate starting material, reagent or major product.

Is this reaction an oxidation, a reduction, or neither? 

5. Fill in the missing reagents in the synthesis

What is the name of this reaction?

What is the name of this reaction?
6. Propose syntheses of the targets below. **All carbons** must come from the starting materials provided, you can use any reagent you wish.

**HINT: COUNT YOUR CARBONS!!!**

**Starting Materials:**

![Diagrams of starting materials]

**Target A.**

![Diagram of target A]

**Target B.**

![Diagram of target B]