1. The addition of HCl to an alkene produces 2-chloropropane. What is the alkene?

2. Give the structural formula for a) an aldehyde that is an isomer of acetone and b) an ether that is an isomer of 1-propanol.

3. Give the IUPAC name for the following acids:
   a. \[
   \begin{align*}
   &\text{H}-\text{C}-\text{O}\text{H} \\
   &\text{(O)}
   \end{align*}
   \]
   b. \[
   \begin{align*}
   &\text{CH}_3\text{CH}_2\text{CH}_2-\text{C}-\text{O}\text{H} \\
   &\text{(O)}
   \end{align*}
   \]
   c. \[
   \begin{align*}
   &\text{CH}_3\text{CH}_2\text{CHCH}_2-\text{C}-\text{O}\text{H} \\
   &\text{(O)}
   \end{align*}
   \]

4. Aldehydes and ketones can be named in a systematic way by counting the number of carbon atoms (including the carbonyl carbon that they contain). The name of the aldehyde of ketone is based on the hydrocarbon with the same number of carbon atoms. The ending for -al for aldehyde or -one for ketone is added as appropriate. Draw the structural formulas for the following aldehydes or ketones: a) propanal b) 2-pentanone, c) 3-methyl-2-butanone, d) 2-methylbutanal.

5. Using condensed structural formulas, write a balanced chemical equation for the addition reaction of 2,4-dimethyl-2-pentene with bromine.

6. Using condensed structural formulas, write a balanced chemical equation for each of the following reactions: a) hydrogenation of cyclohexene; b) addition of H₂O to trans-2-pentene using H₂SO₄ as a catalyst (two products).