Exercise 7: Alcohol-related reactions

1. Give the steps in the mechanism:

   ![Reaction 1](image1)

   - **HBr**
   - **Br**

2. Predict the intermediate and then the product.

   ![Reaction 2](image2)

   - **HCl**
3. Thionyl chloride (and its analogs benzenesulfonyl chloride and methanesulfonyl chloride) is an excellent reagent for “gently” (that is, without extreme temperature or pH conditions) converting an alcohol into a good leaving group. It is used often in conjunction with a pyridine solvent, which acts as a base.

a. Predict the product:

\[
\begin{align*}
\text{CH}_3\text{CH}_2\text{OH} & \quad \xrightarrow{\text{reaction}} \quad \text{pyridine} \\
\text{S} & \quad \text{O} \\
\end{align*}
\]

b. Now that you have a good leaving group on the molecule, what is the result of adding each of the following reagents to the product in part a?

i. NaI

ii. \text{RC} \equiv \text{C}

iii. the acetate ion