1. Complete the following reactions with the appropriate starting material, reagent or major organic product.

\[
\text{Br} \quad \rightarrow \quad \text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3
\]

\[
\text{Br} \quad \rightarrow \quad \text{CH}_3\text{CH}_2\text{COCH}_3
\]

\[
\text{OH} \quad \rightarrow \quad \text{CH}_3\text{CH}_2\text{C≡N}
\]
2. Poly(vinyl alcohol), a hydrophilic polymer used in aqueous adhesives, is made by polymerizing vinyl acetate and then hydrolyzing the ester linkages.

a) Give the structures of poly(vinyl acetate) and poly(vinyl alcohol)

b) Vinyl acetate is an ester. Is poly(vinyl acetate) a polyester? Explain.

c) Hydrolysis in base destroys Dacron® fibers (a polyester). Poly(vinyl acetate) is converted to poly(vinyl alcohol) by basic hydrolysis of the ester groups. Why doesn’t the hydrolysis destroy the poly(vinyl alcohol)?

d) Why is poly(vinyl alcohol) made by this round-about method? Why not just polymerize vinyl alcohol?