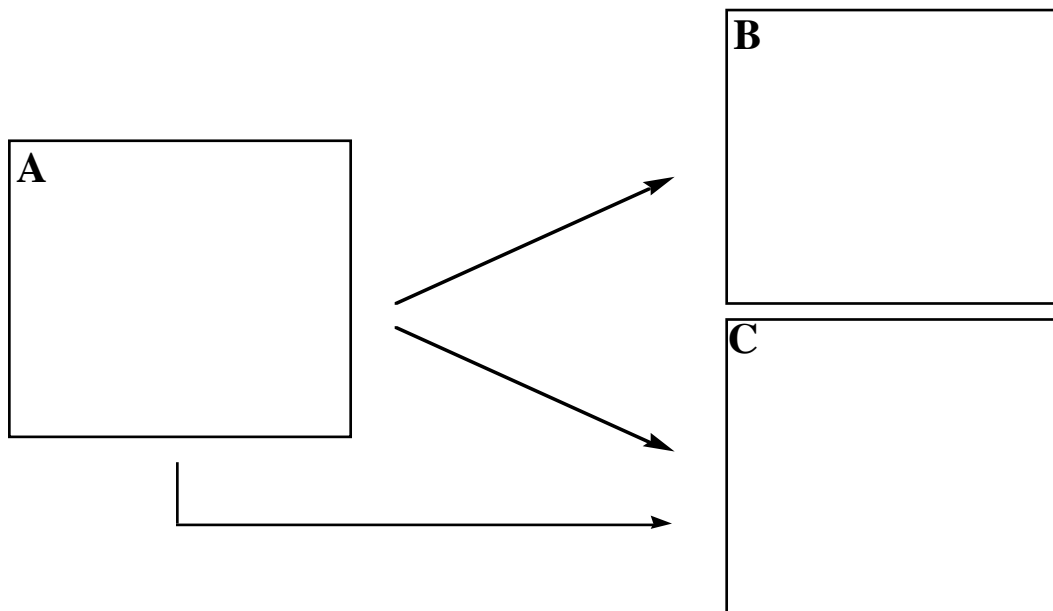


1. Sample **A** has a molecular formula of C_6H_{10} . Reaction of **A** with H_2 / Pd yields a single optically inactive compound, **B**, with a molecular formula of C_6H_{14} . Reaction of **A** with $H_2 / Lindlar$'s gives an optically active molecule, **C**, with a molecular formula of C_6H_{12} . Dissolving metal reduction of **A** also gives **C**. Provide structures for **A**, **B**, and **C** based on this evidence.



2. Compound **A** has a molecular formula of C_8H_{12} . Catalytic hydrogenation of **A** using 1 equivalent of H_2 gas yields **B** (mol. formula C_8H_{14}) as a racemic mixture. Reaction of **A** with ethylene at $150^\circ C$ yields an optically inactive compound **C** with a molecular formula of $C_{10}H_{16}$. Reaction of **A** with NBS and light yields **D** (mol. formula $C_8H_{11}Br$) as a racemic mixture. **A** does not react with Lindlar's catalyst. Provide structures for **A-D**.