• Draw the constitutional formula of the major organic product formed in each of the following reactions.
The incomplete proposed mechanism for the reaction of 2-methyl-2-butene with HBr is shown below. Complete the mechanism by adding curly arrows to illustrate the bonding changes that take place.

Which one of the two reactants is the electrophile?

HBr
- Draw the constitutional structure of the major organic product formed in the following reactions. Indicate the correct isomer where appropriate.

\[
\begin{align*}
\text{Cyclic alkene} + \text{H}_2 & \xrightarrow{\text{Pd catalyst}} \text{Hexane (cis isomer)} \\
\text{Alkene} + \text{HBr} & \xrightarrow{} \text{Bromination (Markovnikov product with H added to less substituted end of double bond)} \\
\text{Cyclohexadiene} + 2\text{Br}_2 & \xrightarrow{} \text{1,3-Dibromo-1,2-di-Br-cyclohexane}
\end{align*}
\]
Give the constitutional formula and the name of the major organic product of each of the following reactions.

Name: 2-methylhex-3-yne
- Use curly arrow notation to illustrate the mechanism of each of the following reactions.

\[
\begin{align*}
\text{CH}_3\text{CCH}_2 + \text{HBr} & \rightarrow \text{CH}_3\text{CH} = \text{CH}_2 + \text{Br}^- \\
\text{CH}_3\text{CH} = \text{CH}_2 + \text{Br} & \rightarrow \text{CH}_3\text{CHCH}_3 + \text{Br} \\
\text{CH}_3\text{C} = \text{C} + \text{HCl} & \rightarrow \text{CH}_3\text{CHCl} + \text{H} \\
\text{CH}_3\text{CHCl} + \text{Cl}^- & \rightarrow \text{CH}_3\text{C} = \text{C} + \text{Cl}^- + \text{H} \\
\text{CH}_3\text{C} = \text{C} + \text{H} & \rightarrow \text{CH}_3\text{CH}_3 + \text{H} \\
\text{CH}_3\text{CH}_3 + \text{H} & \rightarrow \text{CH}_3\text{CHH} = \text{CH}_2 + \text{H} \\
\text{CH}_3\text{CHH} = \text{CH}_2 + \text{H} & \rightarrow \text{CH}_3\text{CHCH}_3 + \text{H} \\
\text{CH}_3\text{CHCH}_3 + \text{H} & \rightarrow \text{CH}_3\text{C} = \text{C} + \text{H} \\
\text{CH}_3\text{C} = \text{C} + \text{H} & \rightarrow \text{CH}_3\text{CH}_3 + \text{H} \\
\text{CH}_3\text{CH}_3 + \text{H} & \rightarrow \text{CH}_3\text{C} = \text{C} + \text{H} \\
\text{CH}_3\text{C} = \text{C} + \text{H} & \rightarrow \text{CH}_3\text{CH}_3 + \text{H} \\
\end{align*}
\]