1. a) Use half-headed curves arrows to show the movement of electrons in the reaction.

\[
\begin{align*}
H_3CCH_3 + Br^- & \rightarrow HBr + H_2CCH_3 \\
& \text{[Diagram of electron movement]} \\
& \text{[Half-headed curve arrows]} \\
& \text{[Diagram of electron movement]} \\
& \text{[Half-headed curve arrows]} \\
\end{align*}
\]

b) Using the BDE table in the textbook, calculate \( \Delta H \) for the reaction in kJ/mol

- Break \( CH_3CH_2 - H \) : +410 kJ/mol
- Make \( H - Br \) : -368 kJ/mol
- \( \Delta H = +42 \) kJ/mol

c) The reaction is (endothermic/exothermic) and energy is (absorbed/released)

d) Draw an energy diagram. Label starting material, product, \( \Delta H^0 \), \( E_a \), and transition state

\[
\begin{align*}
\text{Starting material} & \rightarrow \text{Transition State} \\
\text{Product} & \rightarrow \Delta H^0 \\
E_a & \text{[Diagram of energy levels]} \\
\end{align*}
\]