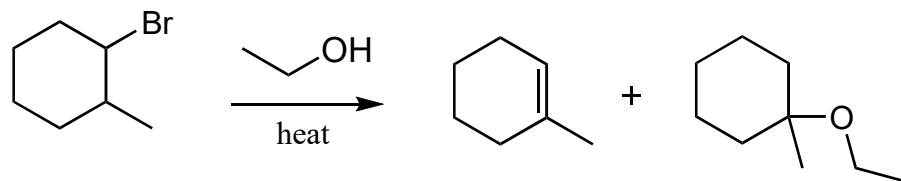
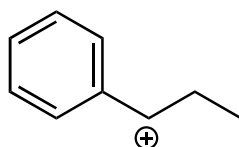


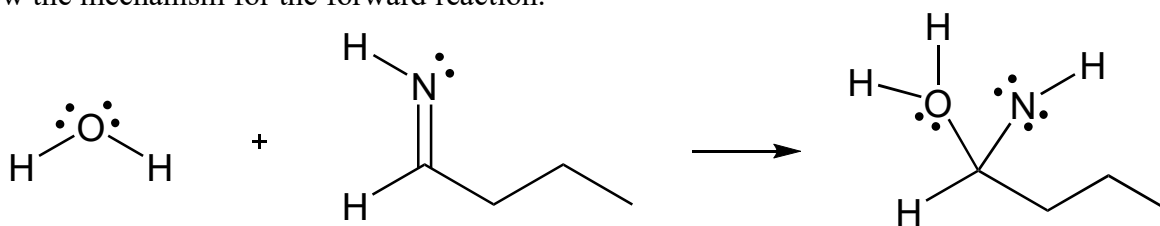
5A) (14 pts) Provide a complete mechanism to account for both products formed in the following reaction. Pay close attention to details, including lone pairs, formal charges and the use of curved arrows.



5B) (4 pts) Is the following carbocation expected to undergo a rearrangement? **Explain why or why not.** If a rearrangement is expected, show the mechanism and draw the result of the rearrangement.



5C) (5 pts) **Add any missing formal charges** (all valence electrons are shown), and **add curved arrows** to show the mechanism for the forward reaction.



5D) (4 pts) If a reaction is *exothermic* and the system exhibits an *increase in entropy*, determine whether or not it will be spontaneous, and whether or not the sign of ΔG is temperature dependent. **Show your work.**

- It is spontaneous only at high temperatures.
- It is spontaneous only at low temperatures.
- It is spontaneous at all temperatures.
- It is not spontaneous at any temperature.

Your answer: