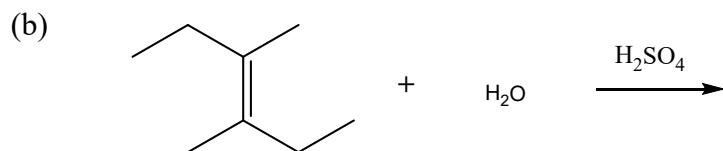
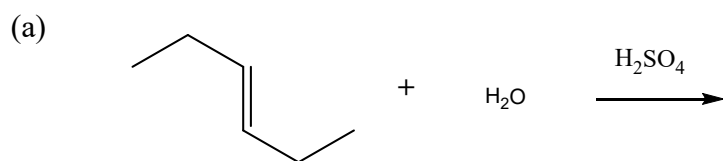


## Exercise 11.5

### Addition of H<sub>2</sub>O to Alkenes

1. For each of the addition reactions below:
- draw curved arrows showing electron movement for the step in which the alkene is protonated,
  - draw the carbocation intermediate formed and classify it as 1°, 2° or 3°,
  - draw curved arrows showing electron movement when the carbocation reacts with water, and draw the product of this step of the reaction,
  - draw curved arrows showing electron movement when the second intermediate is deprotonated, and draw the resulting addition product.



2. For each of the addition reactions below:

- draw curved arrows showing electron movement for the step in which the alkene is protonated,
- draw both possible carbocation intermediates and classify each as 1°, 2° or 3°,
- identify the more stable carbocation intermediate; if it is resonance-stabilized, draw any other relevant resonance structures,
- draw curved arrows showing electron movement when the more stable carbocation reacts with the water, and draw the product(s) of this step of the reaction,
- draw curved arrows showing electron movement for deprotonation of the second intermediate(s), and draw the resulting addition product(s).

