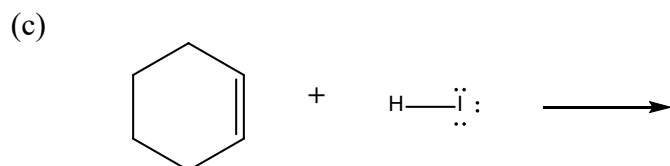
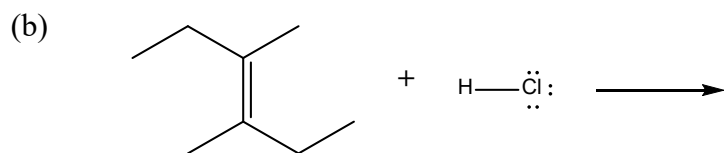
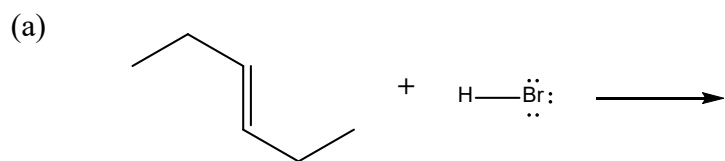


Exercise 11.4

Addition of "HX" to Alkenes

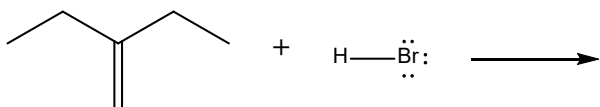
1. For each of the addition reactions below:
- draw curved arrows showing electron movement for the step in which the alkene is protonated,
 - draw the intermediates formed and classify the carbocation as 1°, 2° or 3°,
 - draw curved arrows showing electron movement when the carbocation reacts with the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



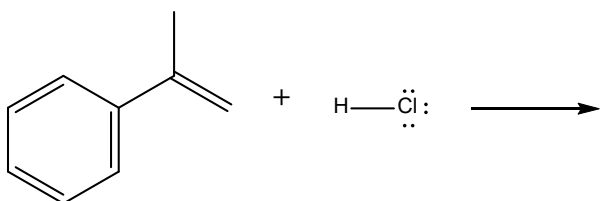
2. For each of the addition reactions below:

- 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 and draw curved arrows showing electron movement when that carbocation reacts with the nucleophile, and
- draw the resulting addition product.

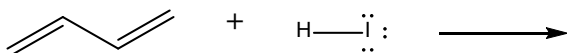
(a)



(b)



(c)



3. In two of the reactions in question 2, carbocation stability is affected by another factor in addition to inductive effects. Identify this factor and show how it is relevant.