ELECTROPHILIC ADDITION – UNSYMMETRICAL ALKENES

1. The following are examples of a primary and secondary carbocation (carbonium ion):

a) What do you understand by the term *carbocation*?

b) Give an example of a primary carbocation which contains 3 carbon atoms.

c) Give an example of a secondary carbocation which contains 4 carbon atoms.

d) Give the structure of the smallest possible tertiary carbocation.

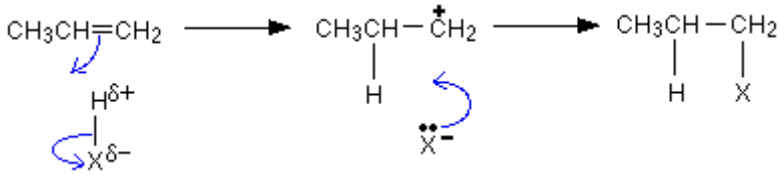
e) Explain why a secondary carbocation is more stable than a primary carbocation.

2. a) State Markovnikov's Rule.

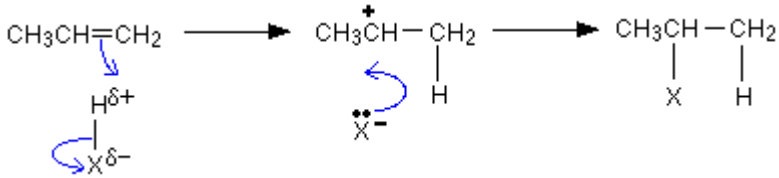
b) Use Markovnikov's Rule to work out the structure of the product formed if an electrophile HX adds to but-1-ene, $CH_3CH_2CH=CH_2$.

c) When propene reacts with an electrophile HX, there are two possible routes the mechanism can follow:

either:



or:



One of these routes happens much more easily than the other, and so one of the possible products is formed in much greater quantities.

Decide which is the faster route, and explain why it is faster.