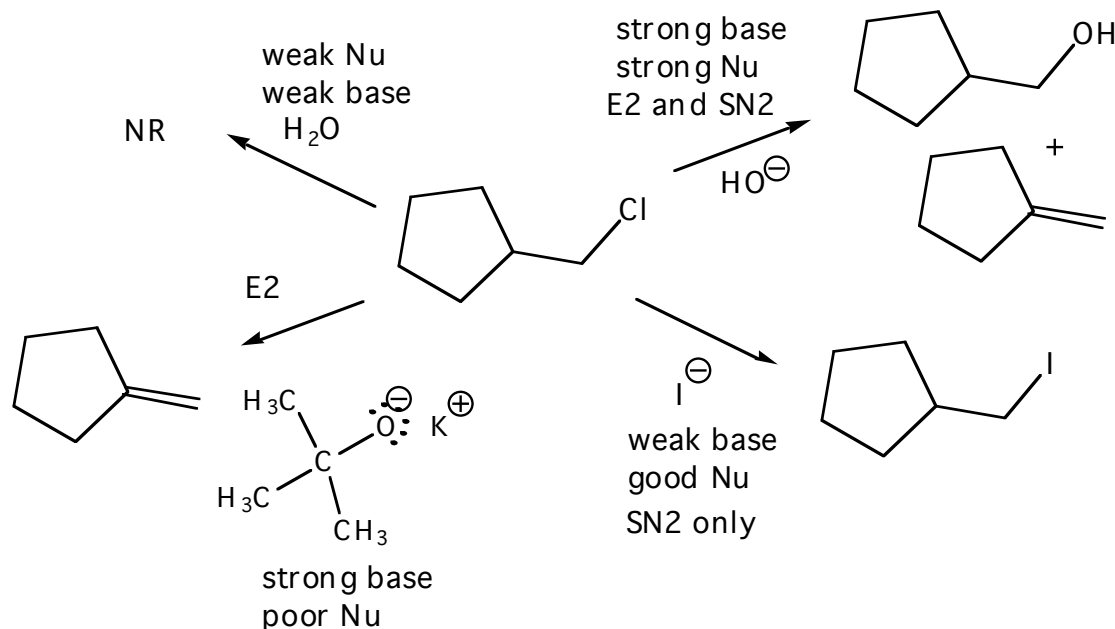


## Exercise 67A – Subelim 2

### Question One

The following substrate is a 1° alkyl halide and can undergo either SN2 or E2 reaction. Reaction of this substrate with the four different base/nucleophiles shown gives different results: no reaction, E2 predominantly, SN2 only or E2 and SN2. Classify the base/nucleophile in each case (strong or weak, base and/or nucleophile) and match the outcome with the reaction.

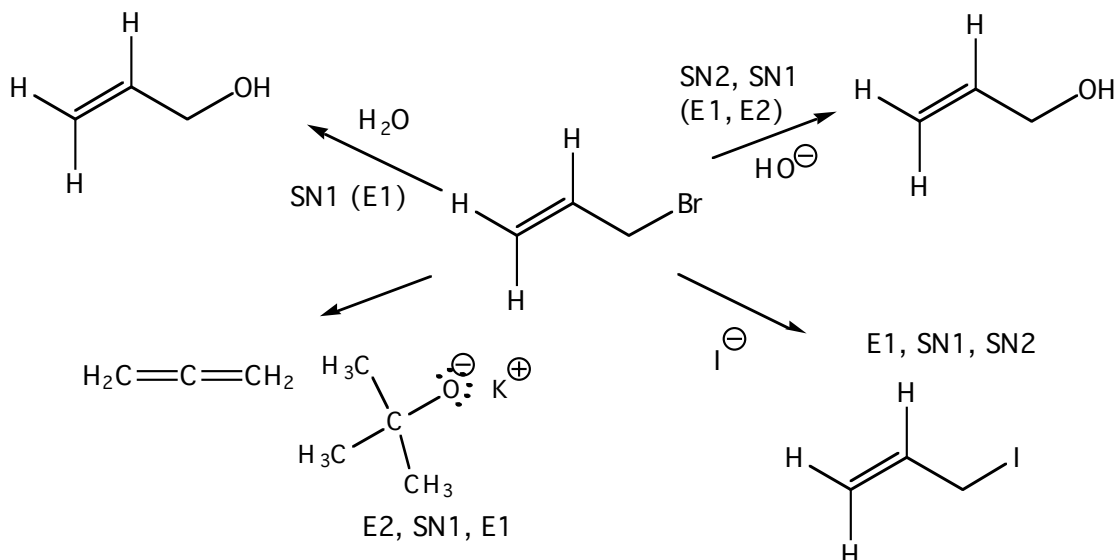
A 1° substrate that will not form a stable carbocation therefore E1 and SN1 are out.



### Question Two

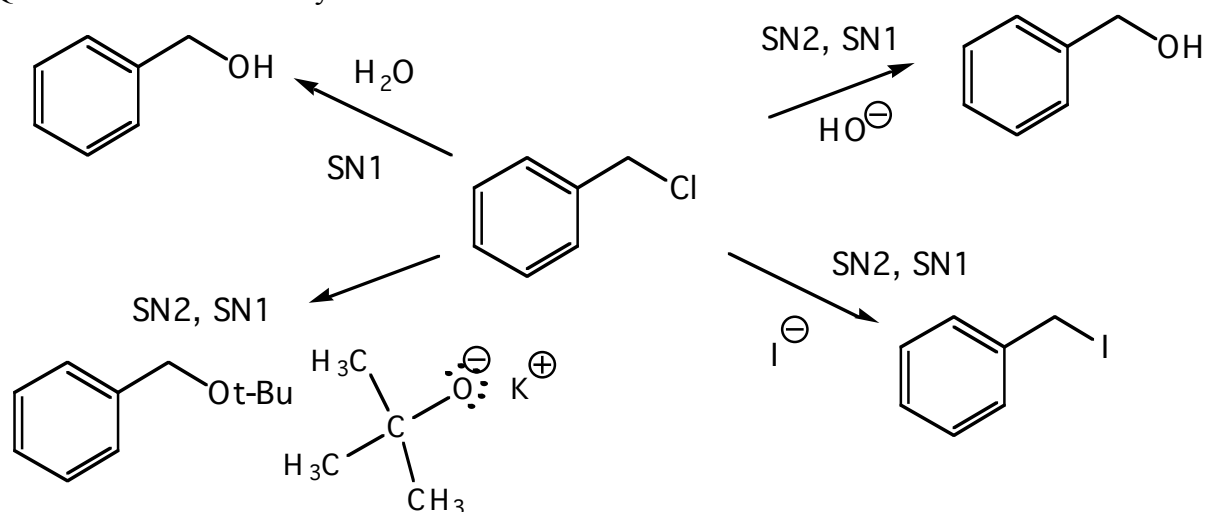
We change the substrate to allyl bromide and things change quite significantly. Why, what are the products, and what mechanisms operate?

This substrate is 1° and allylic, so that it can form a resonance stabilized carbocation making SN1 a possibility. E1 is possible in principle.



### Question Three

We change our substrate to benzyl chloride. What does this substrate have in common with the substrate in Question Two? What key difference does it have that leads to a different outcome in one reaction?

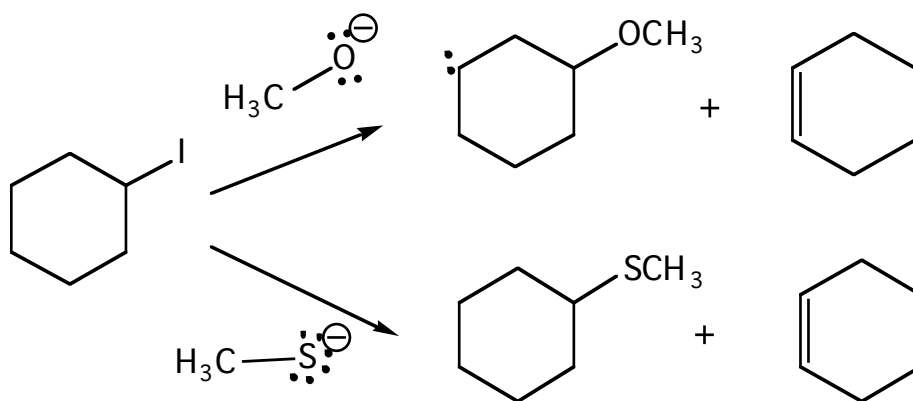


This substrate also forms a resonance stabilized carbocation ( $1^\circ$  and benzylic) but has no beta-hydrogens which eliminates the possibility of  $\text{E}1$  or  $\text{E}2$ .

Note that with t-butoxide we probably get  $\text{S}_{\text{N}}2$  here because  $\text{E}2$  is not an option that can compete.

### Question Four

Which one of the following reactions give a greater proportion of  $\text{E}2$  and why?



The first reaction involves methoxide as base/nucleophile. In the second is the sulfur analogue which is a better nucleophile but weak base. The first reaction will therefore give more elimination.