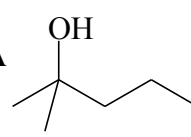
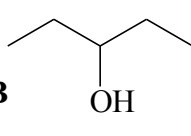
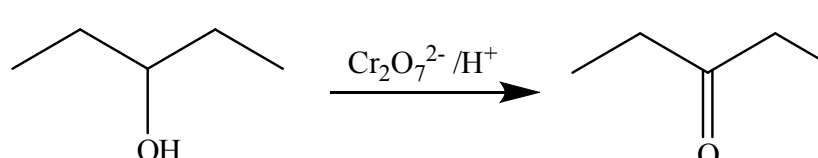
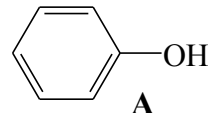
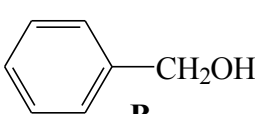
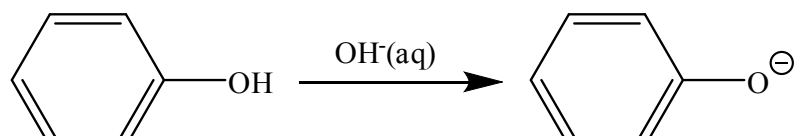
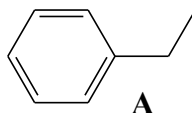
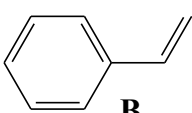
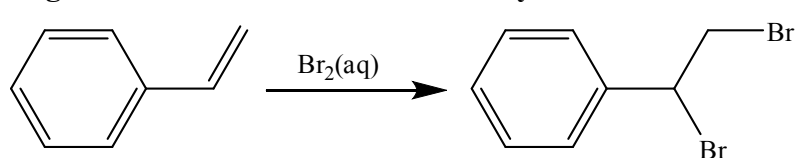
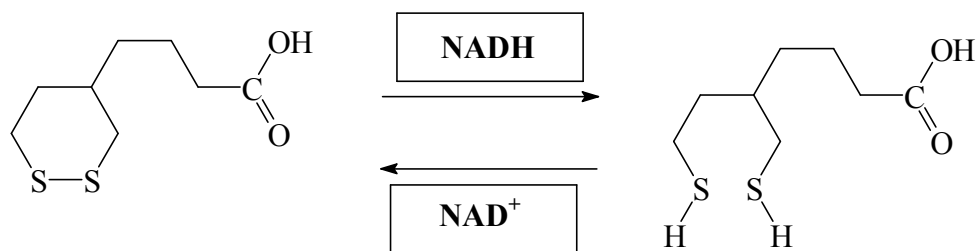


- How would you distinguish between the following pairs of molecules by means of a simple chemical test? In each case, indicate what reagent would be added and any physical change observed. Write an equation for any reaction that occurs. Specify if no reaction occurs by writing "N.R."

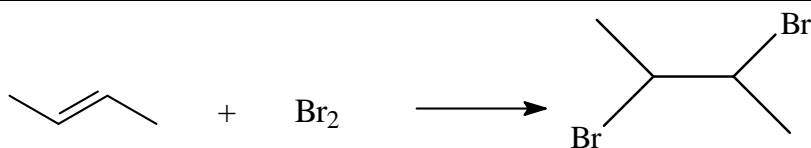
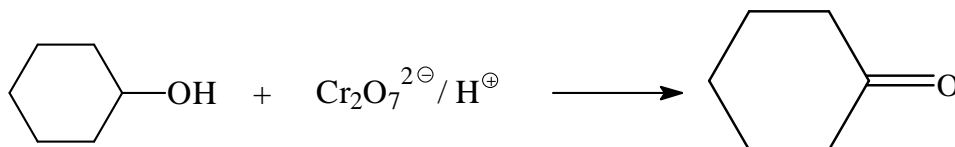
<p>A</p>  <p>B</p> 	<p>The secondary alcohol, B, will be oxidized by acidified chromate to a ketone. The tertiary alcohol, A, will not react with acidified chromate.</p> <p>The orange chromate solution will turn green as Cr(VI) is reduced to Cr(III) in the oxidation of the secondary alcohol:</p> 
<p>A</p>  <p>B</p> 	<p>Phenol, A, will react aqueous hydroxide as it is weakly acidic. (The aromatic ring stabilizes the negative charge on the conjugate base). The alcohol, B, will not react with aqueous hydroxide as it is too weak a base.</p> 
<p>A</p>  <p>B</p> 	<p>The alkene, B, will decolorize bromine water. Br₂ will add across the double bond. A only contains an aromatic ring and this does not react in this way.</p> 

Complete the following by indicating NAD^+ or NADH for the forward and reverse reactions.



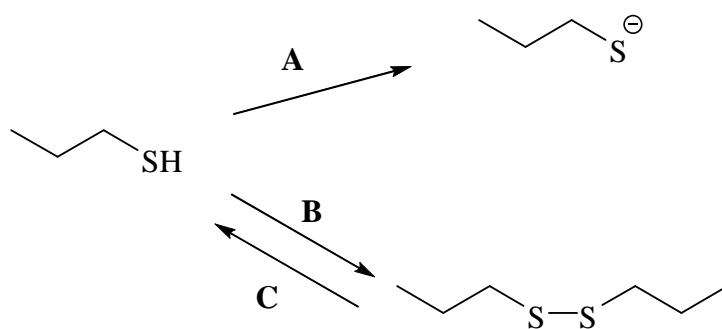
- Draw the constitutional formula(s) of the major organic product(s) of the following reactions.

Marks
2



Marks
3

- Indicate the reagents used in the laboratory to undertake the following transformations.



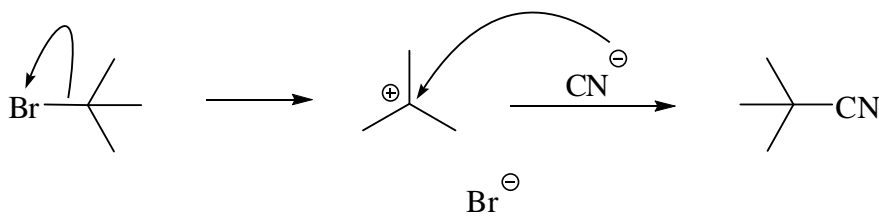
A: A strong base such as NaOH, Na or NaNH₂

B: I₂

C: Zn / H⁺

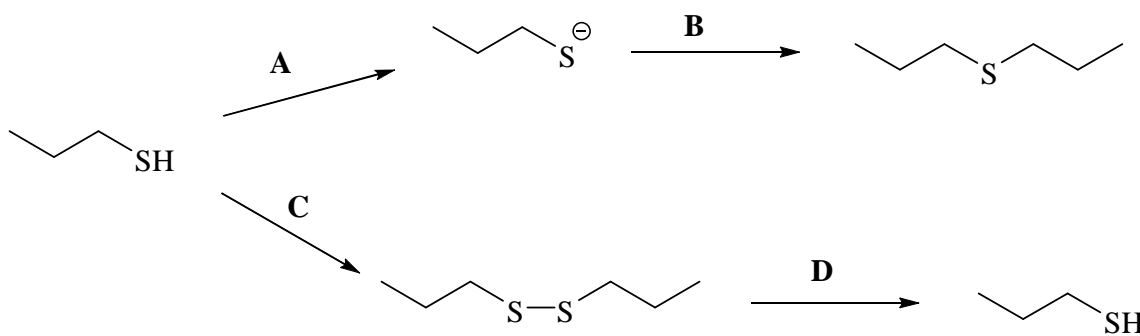
- Add curly arrows to complete the following mechanism.

Marks
1

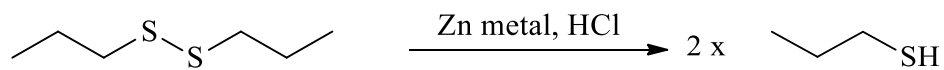


Marks
4

- Indicate the reagents used in the laboratory to undertake the following transformations.

**A:** **NaOH****B:** **$\text{CH}_3\text{CH}_2\text{CH}_2\text{Br}$** **C:** **$\text{H}_2\text{O}_2$** **D:** **$\text{Zn} / \text{H}^+$**

- Give the constitutional formula(s) of the major organic products formed in each of the following reactions:

1

Marks
3

- Show clearly the reagents you would use to carry out the following chemical conversions. Note that more than one step is required and you should indicate all necessary steps and the constitutional formulas of any intermediate compounds.

