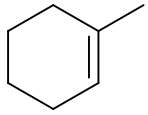
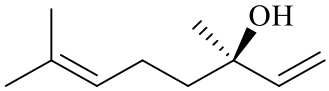
• Complete the following table. Make sure you give the name of the starting material where indicated.

Marks 2

STARTING MATERIAL	REAGENTS/ CONDITIONS	STRUCTURAL FORMULA(S) OF MAJOR ORGANIC PRODUCT(S)
 **Name:**	HBr / CCl_4 (solvent)	

Marks 3

- The structure of (–)-linalool, a commonly occurring natural product, is shown below.

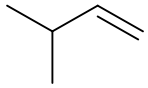
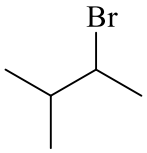
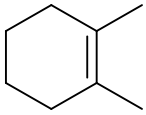
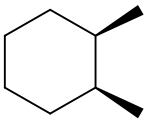
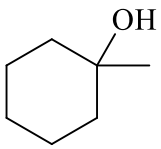
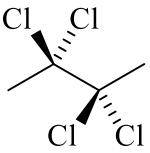


Is it possible to obtain (*Z*) and (*E*) isomers of (–)-linalool? Give a reason for your answer.

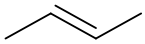
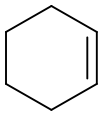
Give the structural formula of the organic product formed from (–)-linalool in each of the following reactions. NB: If there is no reaction, write "no reaction".

Reagents / Conditions	Structural Formula of Product
Br_2 (in CCl_4 as solvent)	
H_2 / Pd-C catalyst	

• Complete the following table. **Marks 4**

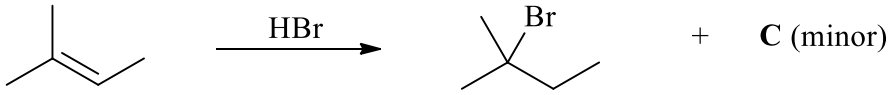
STARTING MATERIAL	REAGENTS/CONDITIONS	THE MAJOR ORGANIC PRODUCT(S)
		
		
	dilute aqueous H_2SO_4	
	2 equivalents of Cl_2	

• Complete the following table. **Marks 2**

STARTING MATERIAL	REAGENTS/ CONDITIONS	CONSTITUTIONAL FORMULA(S) OF MAJOR ORGANIC PRODUCT(S)
	dilute H_2SO_4	
	H_2, Pd/C	

Marks 3

- When alkene **A** is reacted with HBr, the major reaction product is **B**. However, a minor product, **C**, is also formed that is isomeric with **B**.



A **B** (major)

What is the structure of product **C**?

By describing an intermediate formed in this reaction, explain why less of **C** is formed than **B**.

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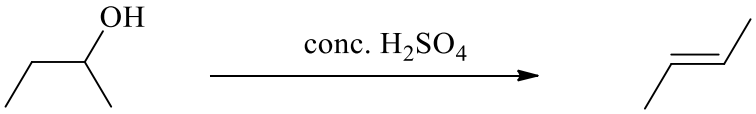
• Complete the following table. **Marks 1**

STARTING MATERIAL	REAGENTS/ CONDITIONS	CONSTITUTIONAL FORMULA(S) OF MAJOR ORGANIC PRODUCT(S)
	HI	

Marks 7

- Consider the following dehydration reaction.

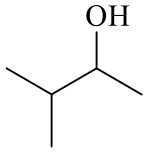


Use curly arrows to show the mechanism of this reaction.

Two minor products are also formed in this reaction. They both have the same molecular formula as the product above. Draw their structures and name them.

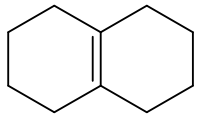
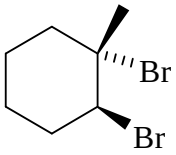
Structure	Name

• Complete the following table. **Marks 1**

STARTING MATERIAL	REAGENTS/ CONDITIONS	CONSTITUTIONAL FORMULA(S) OF MAJOR ORGANIC PRODUCT(S)
	dilute H_2SO_4	

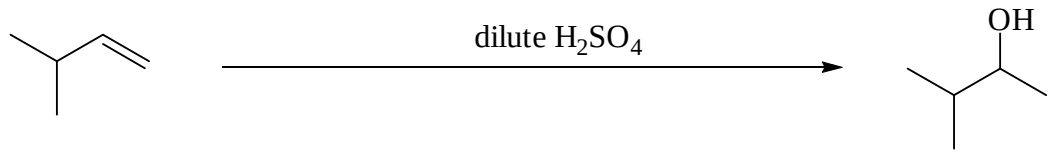
- Complete the following table. Make sure you indicate any relevant stereochemistry.

Marks 4

STARTING MATERIAL	REAGENTS/ CONDITIONS	CONSTITUTIONAL FORMULA(S) OF MAJOR ORGANIC PRODUCT(S)
	H_2/Pd/C (catalyst)	
	Br_2	

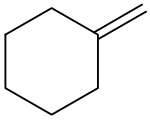
Marks 3

- Complete the mechanism for the following reaction. Give the structure of the carbocation intermediate and indicate (using curly arrows) all the bonding changes that occur.



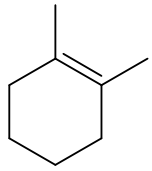
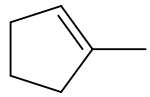
- Complete the following table.

Marks 1

STARTING MATERIAL	REAGENTS/ CONDITIONS	CONSTITUTIONAL FORMULA(S) OF MAJOR ORGANIC PRODUCT(S)
	HBr	

- Complete the following table. Make sure you indicate any relevant stereochemistry.

Marks 6

STARTING MATERIAL	REAGENTS/ CONDITIONS	CONSTITUTIONAL FORMULA(S) OF MAJOR ORGANIC PRODUCT(S)
	H_2/Pd/C (catalyst)	
	aqueous H_2SO_4	

Marks
3

- Give the mechanism of the reaction that occurs when 1-methylcyclohexene is converted to 1-bromo-1-methylcyclohexane by the addition of HBr. Give the structure of the intermediate carbocation that is formed and indicate (with curly arrows) all the bonding changes that occur.

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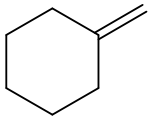
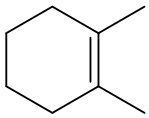
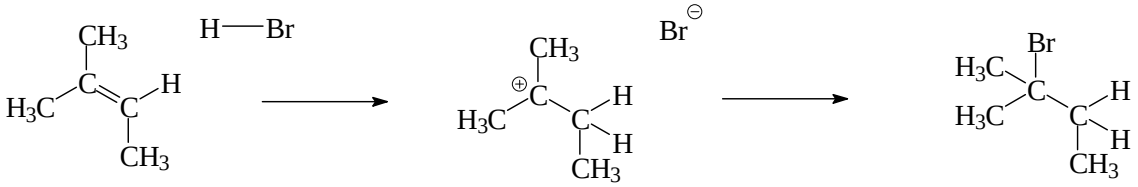
- Complete the following table. Make sure you indicate any relevant stereochemistry.

Marks 3

STARTING MATERIAL	REAGENTS/ CONDITIONS	CONSTITUTIONAL FORMULA(S) OF MAJOR ORGANIC PRODUCT(S)
	dry HI	
$H-C\equiv C-CH_3$	excess Br_2 in CCl_4 solvent	
	H_2 / Pd / C	

- The incomplete proposed mechanism for the reaction of 2-methyl-2-butene with HBr is shown below. Complete the mechanism by adding curly arrows to illustrate the bonding changes that take place.

Marks 2



Which one of the two reactants is the electrophile?

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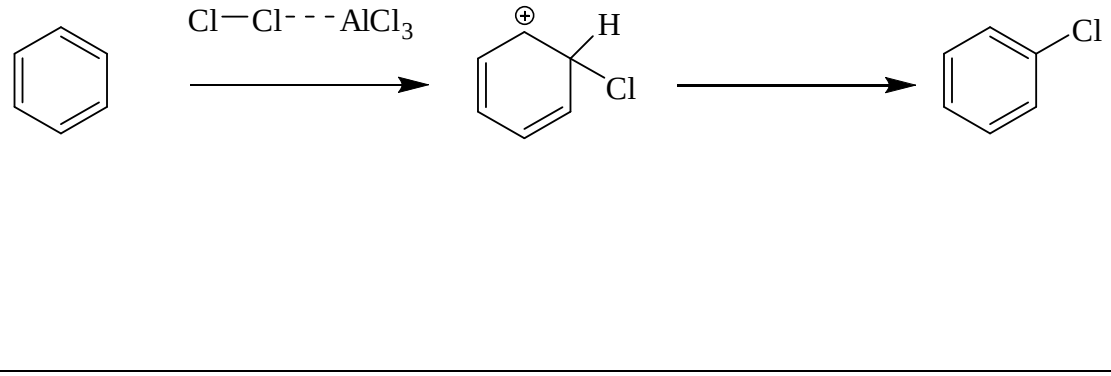
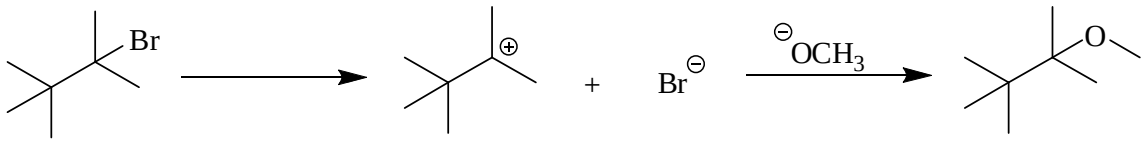
Marks 5

- Complete the following mechanism by adding curly arrows to illustrate the bonding changes that take place.





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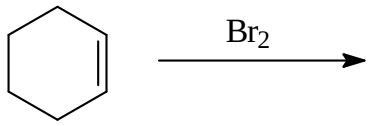
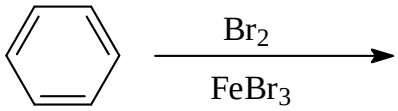
• Draw the constitutional formula of the major organic product formed in each of the following reactions.	**Marks 6**
	
	

Marks 3

- Draw the constitutional structure of the major organic product formed in the following reactions. Indicate the correct isomer where appropriate.