



Raffles Institution
Year 5 H2 Chemistry 2024

Tutorial 11 – Alkenes (Suggested Answers)

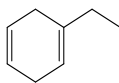
Answers to Self-Check Questions

Q1

- (a) *trans*-3-methylhex-3-ene
(b) *trans*-7-methyloct-3-ene
(c) 2,4-dimethylpent-1-ene
(d) *trans*-2,3,4,5-tetramethylhexa-1,3,5-triene



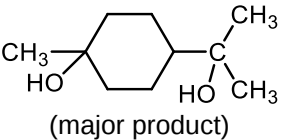
(e)



(f)

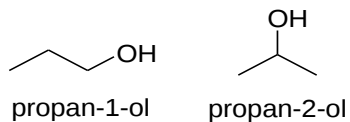
Q2

	Reagents & conditions	Type of reaction	Observations	Structural formulae of organic products
(a)	H ₂ (g), Ni catalyst, heat	reduction	No observable change	
(b)	Br ₂ in CCl ₄	electrophilic addition	Orange-red Br ₂ is decolourised.	
(c)	Br ₂ (aq)	electrophilic addition	Orange Br ₂ (aq) is decolourised.	
(d)	HBr(g)	electrophilic addition	No observable change	
(e)	KMnO ₄ (aq), NaOH, cold	mild oxidation	Purple KMnO ₄ is decolourised AND Brown-black precipitate of MnO ₂ is formed.	
(f)	KMnO ₄ (aq), H ₂ SO ₄ (aq), heat	strong oxidation	Purple KMnO ₄ is decolourised AND colourless gas evolved (CO ₂) gives white ppt with limewater / Ca(OH) ₂ (aq).	

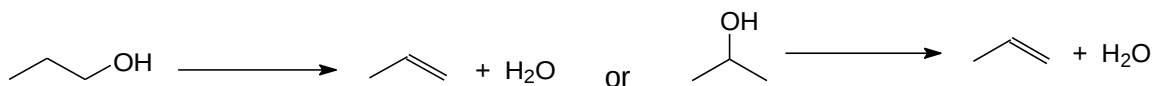
(g)	cold conc. H_2SO_4 , followed by heating with H_2O	electrophilic addition	No observable change	 (major product)
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Q3

(a)



(b)



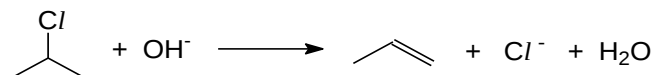
(c)(i) aluminium oxide or alumina

(c)(ii) Carbon is the substance responsible for the black colour. It is produced from the thermal decomposition of the alcohol. *Note: the thermal decomposition of the ethanol is a side reaction.*

(c)(iii) This is done so that the cold water would not be sucked back into the hot test-tube, thereby causing it to crack.

(d)(i) KOH in ethanol, heat

(d)(ii) Type of reaction: elimination
Equation:



4	5	6	7	8	9	10	11	12
C	B	D	C	C	A	A	C	C