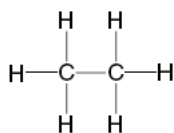


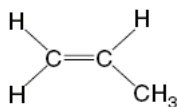
Tutorial 10.2 – Hydrocarbon

May/June 2002

- 5 Crude oil is the principal source of hydrocarbons. The following are examples of such hydrocarbons.



ethane



propene



cyclohexene

- (a) Give the structural formulae of the organic products in the following reactions.

(i) The reaction of ethane with bromine in the presence of u.v. light.

(ii) The polymerisation of propene.

(iii) The oxidation of propene with cold, acidified potassium manganate(VII).

(iv) The reaction of cyclohexene with hydrogen bromide.

(v) The reaction of cyclohexene with hot acidified potassium manganate(VII).

[5]

- (b) Write equations for the following reactions.

(i) The complete combustion of ethane.

(ii) The action of steam on propene in the presence of a catalyst.

(iii) The reaction of cyclohexene with hydrogen in the presence of a catalyst.

(c) The process of cracking produces useful substances from oil.

(i) Explain why cracking is useful.

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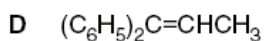
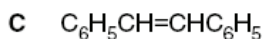
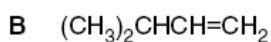
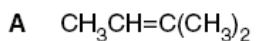
(ii) Suggest an equation for the cracking of $C_{16}H_{34}$ into at least three fragments.

[3]

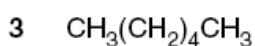
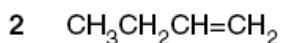
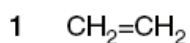
Nov 2002

26 Oxidation of an alkene **Y** gives a diol; further oxidation gives a diketone.

What could be **Y**?



38 When octane is subjected to catalytic cracking, which compounds can be obtained?



May/June 2004

23 Which compound could **not** be obtained from cracking a sample of nonane, $\text{CH}_3(\text{CH}_2)_7\text{CH}_3$?

- A $\text{CH}_3\text{CH}=\text{CHCH}=\text{CHCH}_2\text{CH}_2\text{CH}_2\text{CH}_3$
- B $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$
- C $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}=\text{CH}_2$
- D $(\text{CH}_3\text{CH}_2\text{CH}_2)_3\text{CH}$

40 Which properties of poly(alkenes) and of pvc can cause their disposal to be difficult?

- 1 Poly(alkenes) are highly flammable.
- 2 Poly(alkenes) are non-biodegradable.
- 3 pvc produces harmful combustion products.

October/November 2004

23 How many different substitution products are possible, in principle, when a mixture of bromine and ethane is allowed to react?

- A 3 B 5 C 7 D 9

25 Which reaction occurs with saturated hydrocarbons?

- A catalytic hydrogenation
- B ready decolourisation of aqueous bromine
- C polymerisation
- D thermal cracking

37 Which compounds may result from mixing ethane and chlorine in the presence of sunlight?

- 1 $\text{CH}_3\text{CH}_2\text{Cl}$
- 2 $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3$
- 3 $\text{CH}_3\text{CHClCHClCH}_3$

May/June 2005

38 Which compounds can be obtained from ethene in a **single** reaction?

- 1 CH_3CH_3
- 2 $\text{-(CH}_2\text{CH}_2\text{)-}_n$
- 3 $\text{HOCH}_2\text{CH}_2\text{OH}$