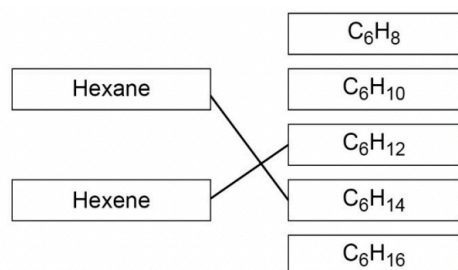


(Alkanes (general formula, structures, combustion))

Q1. (2018)

alkane

Q2.(2020)



Q3.(2020)

Structure and bonding

- both are hydrocarbons
- both contain two carbon atoms (per molecule)
- ethane contains six hydrogen atoms (per molecule)
- (but) ethene contains four hydrogen atoms (per molecule)
- both have covalent bonds
- ethane contains a single C—C bond
- (but) ethene contains a double bond
- both contain C—H bonds
- both small molecules

Reactions

- both react with oxygen in complete combustion reactions
- to produce water and carbon dioxide
- both react with oxygen in incomplete combustion reactions
- to produce water, carbon monoxide and carbon
- incomplete combustion is more likely with ethene
- ethene decolourises bromine water
- (but) ethane does not decolourise bromine water
- ethene is more reactive (than ethane)
- ethene can react with hydrogen (to produce ethane)
- ethene can react with water (to produce ethanol)
- ethene can react with halogens (to produce halogenoalkanes)
- ethene can undergo addition reactions
- ethene can polymerise (to produce poly(ethene))

ignore physical properties
ignore references to flammability

Q4.(2021)

fuel

Q5.a)(2021)

all five points plotted correctly

Q5.b)(2021)

98 (°C)

Q5.c)(2021)

**the boiling point is lower than 0
(°C)**

Q5.d)(2021)

gas

Q5.e)(2021)

C₉H₂₀

Q5.f)(2021)

**(nonane) has a higher boiling
point**

**(so nonane) condenses where
the column has a higher
temperature**

Q6.a)(2022)

C

B

A

Q6.b)(2022)

higher

lower

Q6.c)(2022)

scale labelled at 20, 30, 40, (50)
% at 2 cm intervals

(K) bar drawn to 44%

Q6.d)(2022)

contains more kerosene

Q7.(2022)

C₁₁H₂₄

Q8.(2022)

**a single bond between two
carbon atoms**

Q9.(2022)

carbon dioxide

water

Q10.(2024)

carbon

hydrogen

Q11.(2024)

20

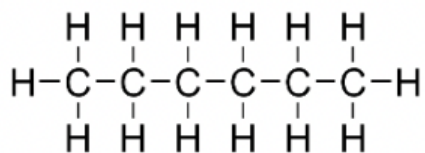
Q12.a)(2024)

C_nH_{2n+2}

Q12.b)(2024)

alkanes

Q12.c)(2024)



Q12.d)(2024)

fuel

Q12.e)(2024)

soot**carbon monoxide**

Q12.f)(2024)

C₆H₁₂

Q12.g)(2024)

bar drawn to 84%**bars labelled C / carbon****and****H / hydrogen**