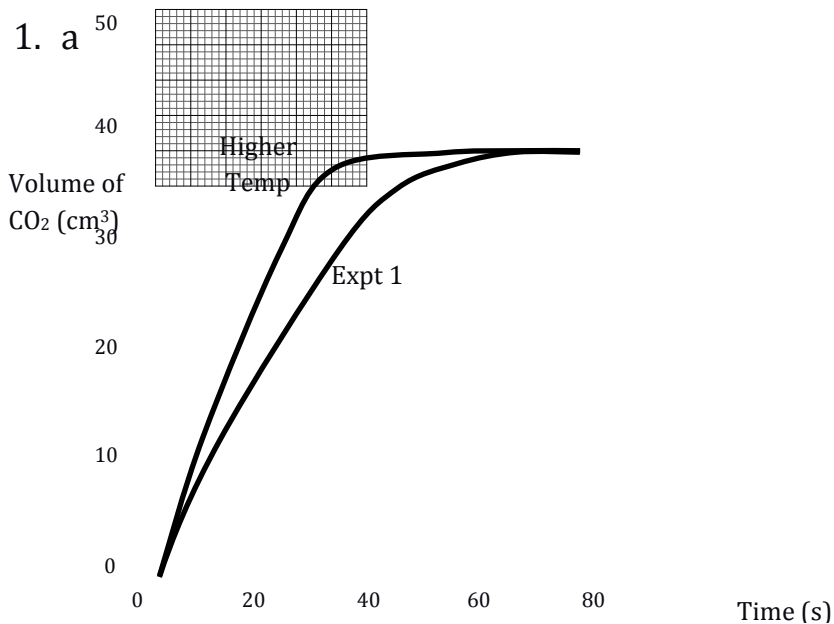


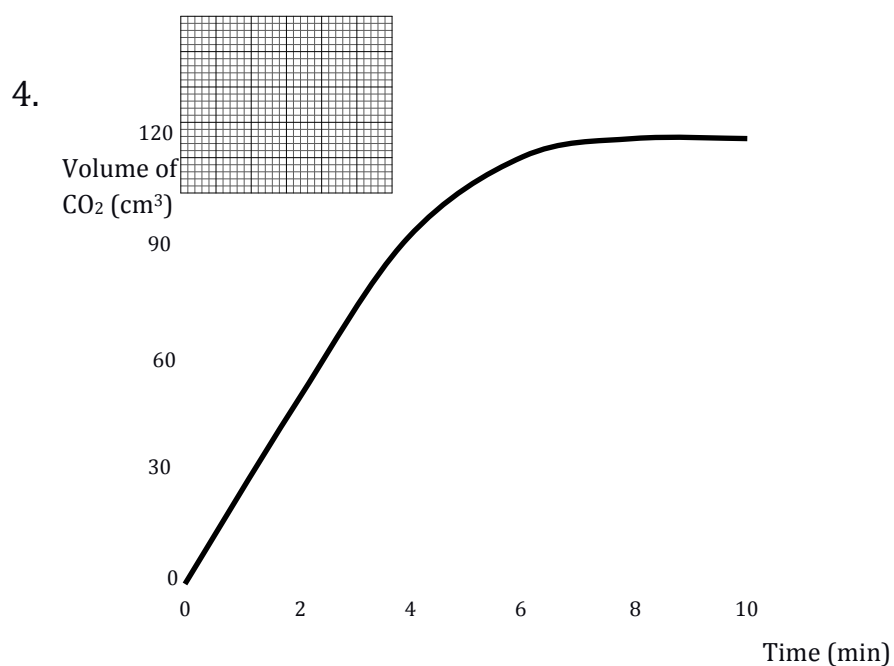
## Unit 1 Rates of Reaction



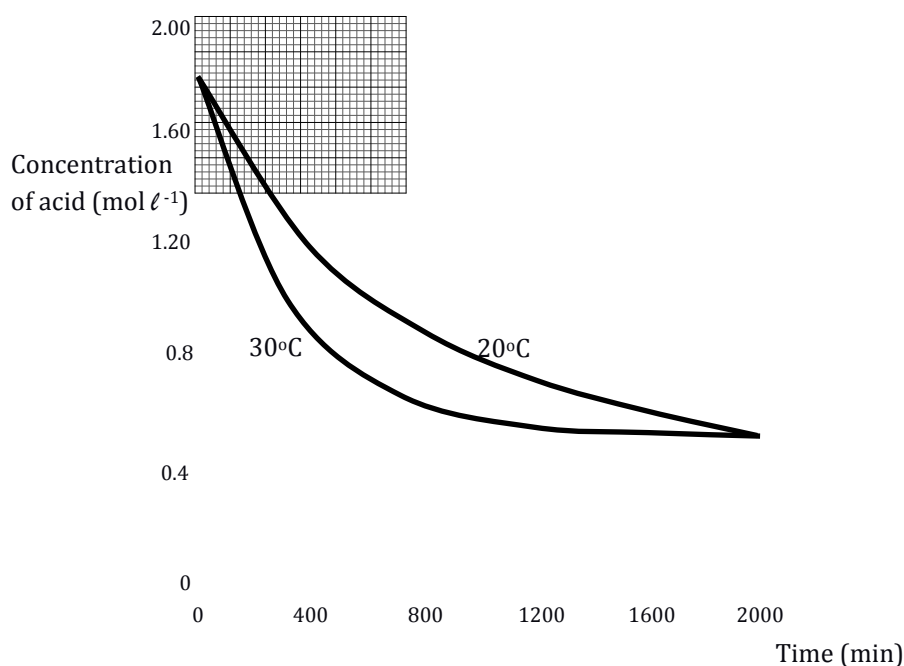
b.  $\frac{34}{40} = 0.85$

2.  $\frac{40 - 20}{20 - 10} = \frac{20}{10} = 2$

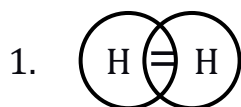
3. a  $\frac{32 - 10}{10 - 2} = \frac{22}{8} = 2.75$



$$5. a. \quad \frac{1.8 - 1.2}{400} = 1.5 \times 10^{-3}$$



### Unit 1 Atomic Structure and Bonding



2. i reduce costs/lower operating temperatures

ii  $\text{Al}_2\text{O}_3$       iii. 3+

3.  $[(\text{NH}_4)^+]_3\text{PO}_4^{3-}$

4. a. Ionic bond

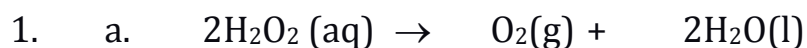
b. As the concentration increases: the freezing point decreases

c. any value between -1.8 and -2.0 °C

5. a. 1 proton; 2 neutrons; 1 electron      b. Protium

6. a

Bonding and Structure Type	Properties
Covalent network	do not conduct electricity & have <b>high</b> melting points
Ionic lattice	have high melting points & conduct electricity when liquid but not when solid
Metallic lattice	conduct electricity when solid and have a wide range of melting points
Discrete covalent molecular	do not conduct electricity & have <b>low</b> melting points

b. SiO<sub>2</sub>**Unit 1      Formulae and reaction quantities.**b. 0.6 litres

2. 51g



b. i) 0.002 moles                      ii) 0.004 moles

4. a. i) 0.001 moles                      ii) 0.04 moles

**Unit 1      Acids and Bases**

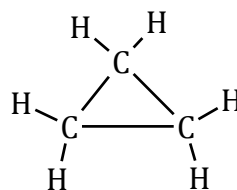
1. C      2. A      3. A      4. Higher

5. copper (II) carbonate

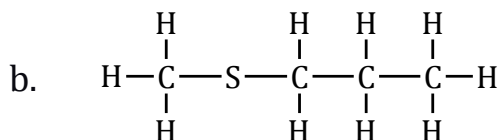
**Unit 2 Homologous Series**

1. C

2.



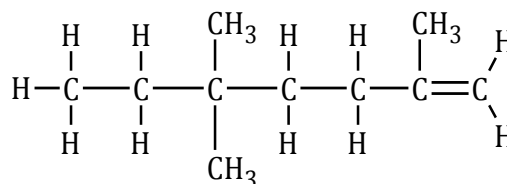
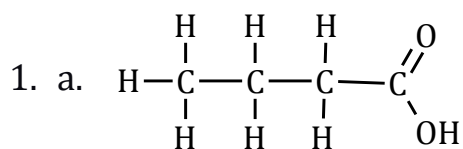
3. Compounds with the same molecular formula but different structures



c. Addition

4. 2,3-dimethylbutane

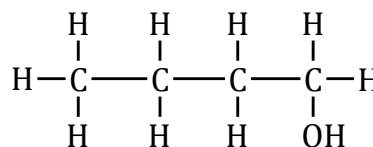
5.

**Unit 2 Everyday Consumer Products**

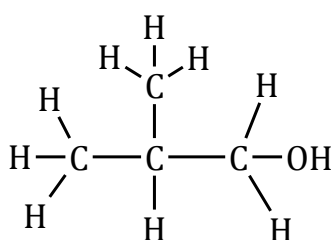
b. pentyl butanoate

2. a. hydration

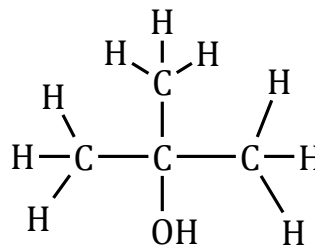
b.



or



or



**Unit 2 Energy from Fuels**

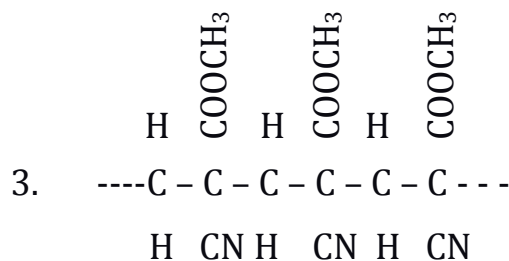
1. i. as the number of carbon atoms in the alcohol molecule increases; the heat energy released increases.
- ii. any value between 2992 and 3004
2. a.  $-2686 \pm 10$
- b.  $E = cm\Delta T = 4.18 \times 0.2 \times 40$   
 energy released =  $33.44 \text{kJ g}^{-1}$  ( $-2474 \text{kJ mol}^{-1}$ )

**Unit 3 Metals**

1. D                    2. A                    3. B
4. positive electrode - chlorine                    negative electrode - strontium
5.  $\text{Na(s)} \rightarrow \text{Na}^+(\text{aq})$
6. a.  $\text{SO}_4^{2-}$  is the spectator ion.                    b.  $\text{Zn(s)} \rightarrow \text{Zn}^{2+}(\text{aq}) + \text{e}^-$
- c. (i) any solution of zinc ions, zinc, copper clockwise from bottom left  
 (ii) to complete the circuit

**Unit 3 Plastics**

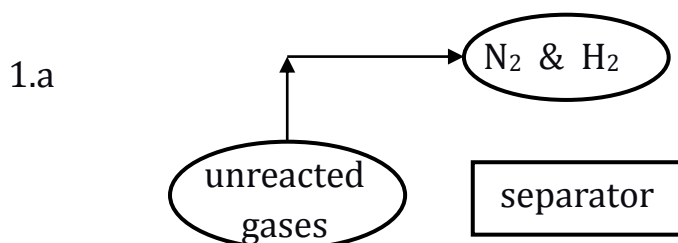
1. D                    2. a.  $\begin{array}{c} \text{Cl} \quad \text{H} \\ | \quad | \\ \text{C} = \text{C} \\ | \quad | \\ \text{Cl} \quad \text{H} \end{array}$                     b. carbon monoxide or  
 hydrogen chloride



b. thermosetting

4. a. F      b. E      5. B

6. 1. Oil      2. Styrene      3. Polyethenol

**Unit 3 Fertilisers**

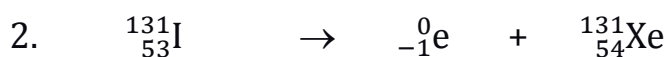
b. i. Platinum

ii. reaction is exothermic and supplies its own energy

2. The rate of the reaction is too slow at 200°C

3. %K =  $(78/174) \times 100 = \underline{44.83\%}$ **Unit 3 Nuclear Chemistry**

1. A      2. A



3. 8 days

