

Video worksheet

Intermolecular forces.

1. Consider the molecule CH_3Cl .

- a. Draw a Lewis dot diagram of this molecule in the box provided below. 2 marks



- b. Describe the shape of this molecule using the VSEPR theory

_____ 2 marks

- c. Classify the shape of this molecule as either symmetrical or asymmetrical by circling the correct response.

Symmetrical

Asymmetrical

- d. Classify the molecule as either polar or non-polar by circling the correct response.

Polar

non-polar

1 mark

- e. Describe the type of intramolecular bonding present

_____ 1 mark

f. Name the intermolecular forces present and justify your answer

2 marks

g. Consider figure 1. It shows a model of the molecule carbon tetrachloride.

i. Name the shape of the molecule

1 mark



Figure 1 – A model of CCl_4

ii. Name the type of :
- Intramolecular bonding present.

1 mark

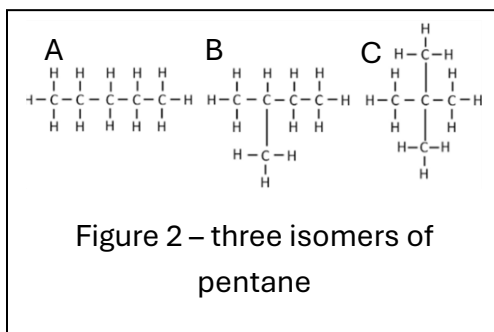
- intermolecular forces present .

1 mark

iii. Justify the answers to question ii. above.

2 marks

2. Consider the three isomers of pentane shown in figure 2, below.



a. Name the intermolecular forces present and give a clear and detailed explanation how these forces come about.

4 marks

b. Place the molecules in order of increasing boiling point from left to right, where left is the lowest and right is the highest.

1 mark

c. Explain your answer to b. above.

4 marks

3. The boiling points of two substances are shown below:

Ethanol ($\text{C}_2\text{H}_5\text{OH}$) = 78°C

Carbon tetrachloride (CCl_4) = 77°C

a. Explain the difference in strength between the intermolecular forces found in $\text{C}_2\text{H}_5\text{OH}$ and those found in CCl_4 .

2 marks

b. With reference to your answer given in question a. above, explain why the boiling temperatures of ethanol ($\text{C}_2\text{H}_5\text{OH}$) and carbon tetrachloride (CCl_4) are almost identical.

2 marks

4. Consider the following hydrocarbons:

Molecule Boiling Point

Ethane $-89\text{ }^{\circ}\text{C}$

Propane $-42\text{ }^{\circ}\text{C}$

Butane $-0.5\text{ }^{\circ}\text{C}$

Explain the trend in boiling point as the carbon chain length increases.

2 marks

5. Complete the table below.

10 marks

Compound	Symmetry	Intramolecular bonding	Intermolecular forces	Molecular shape
NH_3				
SO_3				
CCl_3H				
CH_3OH				
CF_4				