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CHEMISTRY

Physical Chemistry

Level & Board	AQA (A-LEVEL)
TOPIC:	BONDING
PAPER TYPE:	QUESTION PAPER -1
TOTAL QUESTIONS	10
TOTAL MARKS	33

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Bonding

1. This question is about shapes of molecules and ions.

Draw the shape of NCl_3 and of NCl_4^+

Name the shape of NCl_3

Include any lone pairs of electrons that influence the shape.

State and explain the bond angle in NCl_4^+ .

(Total 5 marks)

2. Which molecule is not able to form a co-ordinate bond with another species?

- A. BH_3
- B. CH_4
- C. NH_3
- D. H_2O

(Total 1 mark)

3. This question is about pentan-2-ol and pent-1-ene.

(a) The boiling point of pentan-2-ol is 119°C The boiling point of pent-1-ene is 30°C

Explain why pentan-2-ol has a higher boiling point than pent-1-ene.

(3)

(b) Pent-1-ene is formed by the elimination of water from pentan-2-ol.

State the reagent and condition for this reaction.
Outline the mechanism for this reaction.

(5)

4. Which species has a square planar shape?

- A. NH_4^+
- B. SF_4
- C. XeF_4
- D. PCl_4^+

(Total 1 mark)

5. The melting point of XeF_4 is higher than the melting point of PF_3 .

Explain why the melting points of these two compounds are different.
In your answer you should give the shape of each molecule.

Explain why each molecule has that shape and how the shape influences the forces that affect the melting point.



(Total 6 marks)

6. Which bond has the most unsymmetrical electron distribution?

- A. H–O
- B. H–S
- C. H–N
- D. H–P

(Total 1 mark)

7. Which statement about inorganic ionic compounds is always correct?

- A. They dissolve in water to give neutral solutions.

- B. They release energy when they melt.
- C. They contain metal cations.
- D. They form giant structures.

(Total 1 mark)

8. Which row shows the bonding in ammonium chloride?

Covalent	Dative covalent	Ionic
A. ✓	X	X
B. ✓	✓	X
C. ✓	✓	✓
D. X	X	✓

(Total 1 mark)

9. Which species has a lone pair of electrons on the central atom?

- A. CO₂
- B. SO₂
- C. PCl₆⁻
- D. SO₄²⁻

(Total 1 mark)

10. This question is about compounds containing fluorine.

(a) Draw the shape of a molecule of krypton difluoride (KrF₂).

Include in your answer any lone pairs of electrons that influence the shape.

Name the shape produced by the atoms in a KrF₂ molecule and suggest a bond angle.

(3)

(b) There are two lone pairs of electrons on the oxygen atom in a molecule of oxygen difluoride (OF_2).

Explain how the lone pairs of electrons on the oxygen atom influence the bond angle in oxygen difluoride.

(2)

(c) Silicon tetrafluoride (SiF_4) is a tetrahedral molecule.

Deduce the type of intermolecular forces in SiF_4 .

Explain how this type of intermolecular force arises and why no other type of intermolecular force exists in a sample of SiF_4

(3)

I am Sorry !!!!!



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- Founder & CEO of Chemistry Online Tuition Ltd.
- Completed Medicine (M.B.B.S) in 2007
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