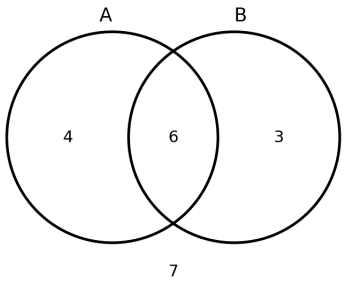
NUNAVUT CHEMISTRY 20 · UNIT A · 25 QUESTIONS

Diversity of Matter and Chemical Bonding — Practice Test

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, use the Flag a mistake button to let Brett know so he can fix it.

1 **In the Venn diagram below, set A is substances that conduct electricity when molten and set B is substances with a high melting point. A substance is ionic if it is in both sets. How many of the substances in the diagram are ionic?**



A 3

B 4

C 6

D 7

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2 **Calcium forms a Ca^{2+} ion and chlorine forms a Cl^{-} ion. The formula of calcium chloride is**

- **A** $CaCl_2$
- **B** Ca_2Cl
- **C** $CaCl$
- **D** $CaCl_3$

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3 **The total number of atoms in one formula unit of $Ca(OH)_2$ is ____.**

ANSWER _____

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4 **In the compound Fe_2O_3, each iron ion has a charge of 3+. The correct name of this compound is**

- **A** iron(II) oxide
- **B** diiron trioxide
- **C** iron(III) oxide
- **D** iron oxide

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5 **The number of sulfur atoms in one formula unit of $Al_2(SO_4)_3$ is**

- **A** 1
- **B** 3
- **C** 2
- **D** 4

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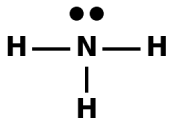
6 **The Lewis diagram below shows ammonia, NH_3. The number of bonding pairs of electrons around the nitrogen atom is**



- **A** 1
- **B** 2
- **C** 3
- **D** 4

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7 **Which of the following compounds contains a polyatomic ion?**

- **A** NaCl
- **B** MgO
- **C** FeS
- **D** $CaCO_3$

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8 **The total number of atoms in one formula unit of ammonium nitrate, NH_4NO_3, is ____.**

ANSWER _____

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9 **The shape of a methane molecule, CH_4, is**

A tetrahedral

B trigonal planar

C bent

D linear

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10 **A substance does not conduct electricity as a solid, but does conduct electricity when molten. The substance is most likely**

- **A** glucose, $C_6H_{12}O_6$
- **B** diamond
- **C** sodium chloride
- **D** copper

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11 **Aluminum forms an Al^{3+} ion, and the sulfate ion is SO_4^{2-}. In the formula of aluminum sulfate, the total number of oxygen atoms is ____.**

ANSWER

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12 **The electronegativity of hydrogen is 2.20 and the electronegativity of chlorine is 3.16. The bond between hydrogen and chlorine in HCl is best described as**

A polar covalent

B nonpolar covalent

C ionic

D metallic

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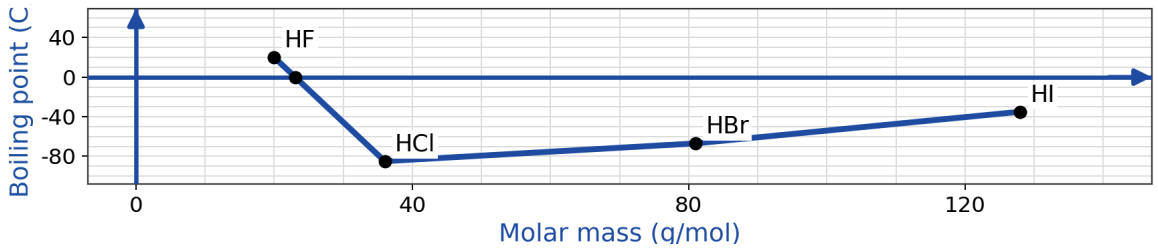
13 **The graph below plots the boiling point of each hydrogen halide against its molar mass. Which hydrogen halide has the strongest intermolecular forces?**



- **A** HF
- **B** HCl
- **C** HBr
- **D** HI

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14 **The total number of valence electrons in a molecule of carbon dioxide, CO_2, is ____.**

ANSWER _____

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15 **Copper forms a Cu^{2+} ion, and the phosphate ion is PO_4^{3-}. The formula of copper(II) phosphate is**

- **A** $Cu_3(PO_4)_2$
- **B** $CuPO_4$
- **C** $Cu_2(PO_4)_3$
- **D** $Cu(PO_4)_2$

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16 **A substance has a melting point of 801°C, does not conduct electricity as a solid, and conducts electricity when molten or dissolved in water. This substance is best classified as**

- **A** a molecular compound
- **B** a metal
- **C** a covalent network solid
- **D** an ionic compound

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17 **A sulfur atom has 6 valence electrons. The number of electrons a sulfur atom gains when it forms its most common ion is ____.**

ANSWER _____

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18 **The correct name of NH_4Cl is**

A ammonia chloride

B ammonium chloride

C ammonium chlorate

D nitrogen tetrahydride chloride

Understand It with Pulse | Flag a mistake

19 **The hydrate $CuSO_4 \cdot 5H_2O$ has water molecules trapped in its crystal. The total number of hydrogen atoms in one formula unit of this hydrate is ____.**

ANSWER _____

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20 **Which of the following molecules is nonpolar?**

A H_2O

B CO_2

C NH_3

D HCl

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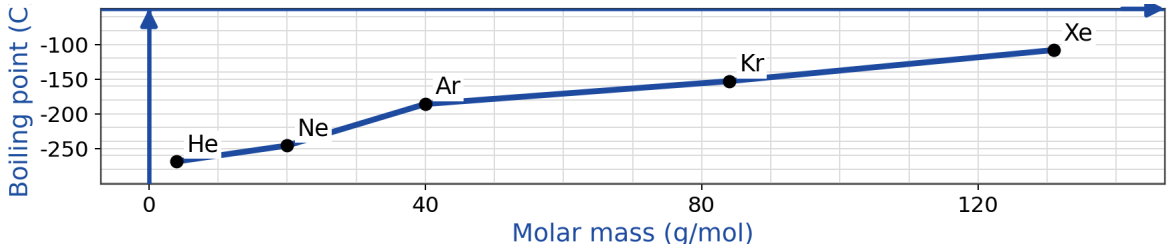
21 **The graph below plots the boiling point of each noble gas against its molar mass. Which noble gas has the strongest London dispersion forces?**



- **A** He
- **B** Ar
- **C** Kr
- **D** Xe

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22 **In a molecule of nitrogen gas, N_2, the two nitrogen atoms are joined by a triple covalent bond. The total number of electrons shared between the two atoms is ____.**

ANSWER _____

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23 **An oxygen molecule, O_2, has each oxygen atom with two lone pairs, with the atoms joined so that each atom has an octet. The bond between the oxygen atoms is a**

- **A** single bond
- **B** ionic bond
- **C** double bond
- **D** triple bond

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24 **In the compound SnF_2, each tin ion has a charge of 2+. The correct name of this compound is**

- **A** tin difluoride
- **B** tin fluoride
- **C** tin(I) fluoride
- **D** tin(II) fluoride

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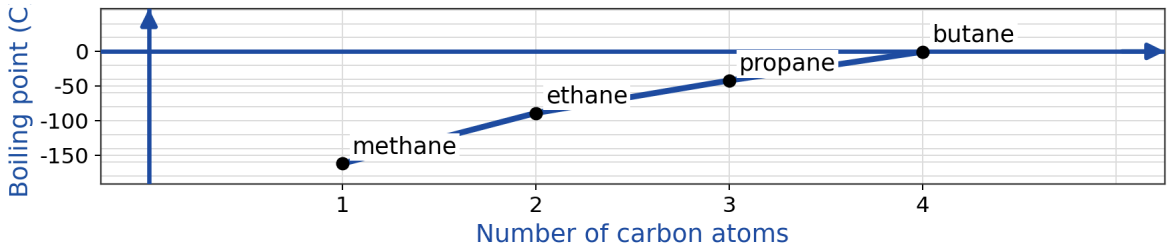
25 **The graph below plots the boiling point of each alkane against the number of carbon atoms in its molecule. Which alkane has the strongest London dispersion forces?**



A methane

B ethane

C propane

D butane

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ANSWER KEY

1. C
2. A
3. 5
4. C
5. B
6. C
7. D
8. 9
9. A
10. C
11. 12
12. A
13. A
14. 16
15. A
16. D
17. 2
18. B
19. 10
20. B
21. D
22. 6
23. C
24. D
25. D

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