

Brett Robbins Academic Consulting

Chemistry 20 Practice Test

Unit A: Diversity of Matter and Chemical Bonding

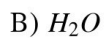
25 Questions

Original practice questions written to the Alberta curriculum, in the style of past diploma examinations. Work through each question, then check your answers with the key at the end.

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, contact Brett for clarification.

Question 1

Which of the following compounds is an ionic compound?



Question 2

Calcium forms a Ca^{2+} ion and chlorine forms a Cl^- ion.

The formula of calcium chloride is



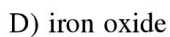
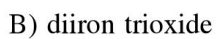
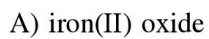
Question 3

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

Question 4

In the compound Fe_2O_3 , each iron ion has a charge of 3+.

The correct name of this compound is



Question 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 |

Question 6

In the Lewis diagram of ammonia, NH_3 , the nitrogen atom forms a single bond to each hydrogen atom. The number of bonding pairs of electrons around the nitrogen atom is

- | | |
|------|------|
| A) 1 | B) 2 |
| C) 3 | D) 4 |

Question 7

Which of the following compounds contains a polyatomic ion?

- | | |
|-----------|-------------|
| A) $NaCl$ | B) MgO |
| C) FeS | D) $CaCO_3$ |

Question 8

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

Question 9

The shape of a methane molecule, CH_4 , is

- A) tetrahedral
- B) trigonal planar
- C) bent
- D) linear

Question 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

Question 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 ____.

Question 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

Question 13

Which of the following pure substances has hydrogen bonding as its strongest intermolecular force?

- | | |
|-----------|-----------|
| A) CH_4 | B) H_2S |
| C) HCl | D) H_2O |

Question 14

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

Question 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) $Cu(PO_4)_2$ |

Question 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

Question 17

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

Question 18

The correct name of NH_4Cl is

- A) ammonia chloride
- B) ammonium chloride
- C) ammonium chlorate
- D) nitrogen tetrahydride chloride

Question 19

The hydrate $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ has water molecules trapped in its crystal.

The total number of hydrogen atoms in one formula unit of this hydrate is ____.

Question 20

Which of the following molecules is nonpolar?

A) H_2O

B) CO_2

C) NH_3

D) HCl

Question 21

In liquid bromine, Br_2 , the molecules are held to one another only by

A) hydrogen bonds

B) London dispersion forces

C) dipole – dipole forces

D) ionic bonds

Question 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 ____.

Question 23

A Lewis diagram of an oxygen molecule, O_2 , shows 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

Question 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

Question 25

Which of the following properties is typical of a molecular compound?

- A) a high melting point
- B) conducts electricity when molten
- C) a low melting point and no electrical conductivity
- D) forms a crystal lattice of ions

Answer Key

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

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