Structure and Properties of Matter — Practice Test

Ontario Chemistry, Grade 12, University Preparation (SCH4U) • 25 questions

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 **The shape of a molecule with two bonding pairs and two lone pairs on the central atom is**

- A Bent
- B Linear
- C Trigonal planar
- D Tetrahedral

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2 **Ammonia has a trigonal pyramidal shape because nitrogen has**

A Two bonding pairs

B No lone pairs

C Three bonding pairs and one lone pair

D Four bonding pairs

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3 **Carbon dioxide is linear because carbon has**

A One lone pair

B Two single bonds

C Four bonding pairs

D Two double bonds and no lone pairs

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4 **Which molecule is nonpolar despite having polar bonds**

A Hydrogen chloride

B Ammonia

C Carbon dioxide

D Water

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5 **Hydrogen bonding occurs between molecules containing hydrogen bonded to**

A Sulfur only

B Any metal

C Nitrogen oxygen or fluorine

D Carbon only

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6 **Which substance has the highest boiling point due to hydrogen bonding**

A Ethane

B Methane

C Hydrogen sulfide

D Water

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7 **London dispersion forces are present in**

A Only metals

B Only ionic compounds

C All molecules

D Only polar molecules

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8 **Dipole dipole forces occur between**

A Ions and metals

B Polar molecules

C Nuclei

D Nonpolar atoms only

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9 **Ionic compounds generally have high melting points because of strong**

A Dispersion forces only

B Covalent bonds

C Hydrogen bonds

D Electrostatic attractions between ions

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10 **Which substance conducts electricity when molten but not as a solid**

- A Diamond
- B Glucose
- C Methane
- D Sodium chloride

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11 **Diamond is hard because each carbon atom is bonded to four others in a**

- A Single chain
- B Three dimensional network
- C Layered sheet
- D Ring only

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12 **Graphite conducts electricity because it has**

A Metallic bonds only

B Hydrogen bonds

C Free ions

D Delocalized electrons between layers

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13 **Atomic radius generally decreases across a period because of increasing**

A Neutron number

B Nuclear charge pulling electrons closer

C Number of shells

D Shielding only

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14 **Ionization energy generally increases across a period because electrons are**

A Farther from the nucleus

B Shielded more

C In higher shells

D Held more tightly

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15 **Electronegativity is a measure of an atoms ability to**

A Lose an electron

B Attract shared electrons in a bond

C Form an ion

D Gain a neutron

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16 **Which element has the highest electronegativity**

A Oxygen

B Chlorine

C Nitrogen

D Fluorine

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17 **A polar covalent bond forms between atoms with**

A Equal sharing always

B Identical electronegativity

C Different electronegativity

D No electronegativity

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18 **The bond in sodium chloride is best described as**

A Covalent

B Metallic

C Hydrogen

D Ionic

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19 **Metals conduct electricity because of**

A Free ions in solution

B Hydrogen bonds

C Covalent bonds

D Mobile delocalized electrons

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20 **Which intermolecular force is strongest**

A Hydrogen bonding

B London dispersion

C All are equal

D Dipole dipole

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21 **Water has a high surface tension mainly because of**

A London forces only

B Ionic bonds

C Metallic bonds

D Hydrogen bonding

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22 **The boiling point of ethanol is higher than that of ethane mainly because ethanol can form**

- A No bonds
- B Hydrogen bonds
- C Metallic bonds
- D Ionic bonds

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23 **A molecule with a trigonal planar shape has bond angles of about**

- A 180 degrees
- B 120 degrees
- C 90 degrees
- D 109 degrees

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24 **Methane has bond angles of about**

- A 120 degrees
- B 109 degrees
- C 180 degrees
- D 90 degrees

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25 **Sulfur hexafluoride has an octahedral shape with bond angles of**

- A 180 degrees only
- B 120 degrees
- C 90 degrees
- D 109 degrees

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ANSWER KEY

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

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