HW06 - Periodic Trends and Bonding

This is a preview of the published version of the quiz

Started: Jul 7 at 9:44am

Quiz Instructions

Homework 06 - Periodic Trends and Bonding

Question 1 **1 pts**

Let X be a hypothetical element. Which of the following would be the largest?

- X^{+}
- X^{-}
- X
- X^{2-}
- X^{2+}

Question 2 **1 pts**

If the following crystallize in the same type of structure, which has the lowest lattice energy?

- SrO
- CaO
- SrS
- BaS
- BaO

Question 3

1 pts

Which pair of elements is most likely to form an ionic compound?

- oxygen and chlorine
- nitrogen and sulfur
- sodium and aluminum
- magnesium and fluorine

Question 4

1 pts

Compounds which are characterized as covalent are generally made up of elements found in which part of the periodic table?

- left and right
- upper left
- upper right
- lower left

Question 5

1 pts

Which is the correct order of increasing bond strength?

- single, double triple
- triple, double, single
- double, triple, single
- double, single, triple

Question 6

1 pts

Which do you predict to have the strongest C-N bond?

- NH_2CH_3
- $NHCH_2$
- HCN
- All are equal.

Question 7

1 pts

Which of the following contains only covalent bonding and no ionic bonding?

- Na_2SO_4
- $Ca(NO_3)_2$
- NaOH
- CCl_4

Question 8

1 pts

How many valence electrons are in a Kr atom?

- 2
- 0
- 7
- 8

Question 9

1 pts

The P^{2-} anion has how many total electrons and how many valence electrons respectively?

- 16, 6
- 17, 8
- 17, 7
- 17, 6
- 16, 8
- 18, 8
- 16, 7

Question 10

1 pts

What total number of valence electrons should appear in the dot formula for the chlorate ion ClO_3^-?

- 30
- 26
- 24
- 28

Question 11

1 pts

An element E has the electronic configuration [Ne] $3s^2$ $3p^1$. Write the formula of its compound with sulfate?

- E_3SO_4
- E_2SO_4
- $E_2(SO_4)_3$
- $E_3(SO_4)_2$

- $E(SO_4)_3$

Question 12

1 pts

An element E has the electronic configuration $1s^2\ 2s^2\ 2p^4$. What is the formula of its compound with lithium?

- Li_2E
- Li_4E
- LiE
- LiE_2

Question 13

1 pts

Which of the following demonstrates the formation of an ionic compound involving the elements Na and S?

- None of these.
- $Na^{2+} + S^{2-} \longrightarrow NaS$
- $Na^{+} + Na^{+} + S^{2-} \longrightarrow Na_2S$
- $Na^{+} + Na^{+} + Na^{+} + S^{3-} \longrightarrow Na_3S$
- $Na^{2+} + Na^{2+} + Na^{2+} + S^{3-} + S^{3-} \longrightarrow Na_3S_2$
- $Na^{+} + S^{-} \longrightarrow NaS$

Question 14

1 pts

Which of the following is the best representation of the compound calcium sulfide?

- $3Ca^{2+}, 2S^{3-}$
- $2Ca^{+}, S^{2-}$

- Ca^{2+}, $2S^{-}$
- Ca^{2+}, S^{2-}
- Ca^{+}, S^{-}

Question 15

1 pts

What is the bond order of the O-O bond in O_2?

- 3
- 0
- 1
- 2

Question 16

1 pts

How many lone pairs of electrons are on nitrogen in NF_3?

- two
- zero
- one
- three

Question 17

1 pts

How many unshared electrons and bonding electrons exist around the central atom in ozone (O_3)?

- two, six
- zero, eight

- six, two
- four, four

Question 18

1 pts

What is the bond order of the C-C bond in acetylene (ethyne, C_2H_2)?

- 3
- 1.5
- 2
- 1

Question 19

1 pts

How many total bonds and lone pairs exist in the Lewis structure for chlorine fluoride (ClF)?

- 1, 4
- 1, 6
- 3, 2
- 2, 4

Question 20

1 pts

Which of the following contains exactly one unshared pair of valence electrons?

- PH_3
- SiH_4
- C_2H_4

- H_2S

Question 21

1 pts

How many total bonds and lone pairs exist in the Lewis structure for boron trichloride (BCl_3)?

- 4, 7
- 3, 10
- 4, 8
- 3, 9

Question 22

1 pts

The carbonate ion (CO_3^{2-}) has how many resonance configurations?

- 2
- 4
- 3
- The carbonate ion does not exhibit resonance.

Question 23

1 pts

Resonance is a concept that describes the bonding in molecules...

- by asserting that double bonds 'flip' or resonate between two locations in the molecule.
- by asserting that electrons in a double bond can delocalize (spill over) onto adjacent single bonds to make a bond and a half.
- where there is more than one choice of location for a double bond as deduced from Lewis dot structures. The true bonding is the average over all possible double bond locations.

Question 24

1 pts

How many resonance structures can be drawn for N_2O? Disregard any structure with formal charges other than 0, +1, and -1.

- 0
- 2
- 1
- 3

Question 25

1 pts

How many double bonds are present in the 'best' resonance structure of the phosphate ion?

- 0
- 2
- 1
- 3

Question 26

1 pts

Calculate the formal charge on N in the molecule NH_3.

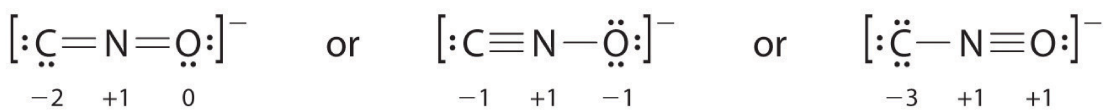
- 1
- 0
- 2
- 3

Question 27

1 pts

Which of the three Lewis structures is the most important for the fulminate ion (CNO^-)?

A B C



- A, B, and C
- A and B
- C only
- B only
- B and C
- A and C
- A only

Question 28

1 pts

Name the compound $CaBr_2$.

- calcium bromine
- calcium bromide
- calcium dibromide
- calcium (II) bromide

Question 29

1 pts

Choose the formula for the compound magnesium sulfide.

- MgS_2
- Mg_2S
- MgS
- Mg_2S_3

Question 30

1 pts

Choose the pair of names and formulae that do not match.

- N_2O_3 : dinitrogen trioxide
- $MgSO_4$: magnesium sulfate
- KNO_3 : potassium nitrate
- $SiCl_4$: silicon tetrachloride
- $SnCl_4$: tin (V) chloride

Question 31

1 pts

What is the formula of dinitrogen pentoxide?

- NO
- N_2O
- N_2O_5
- NO_3
- N_3O_2

Question 32

1 pts

Name the compound CaC_2O_4.

- calcium oxalate
- calcium carboxide
- cadmium oxalate
- cadmium carboxide
- calcium carbonate

Question 33

1 pts

Give the formula for sodium nitrate.

- Na_2NO_3
- $NaNO_3$
- $Na(NO_3)_2$
- $Na(NO)_3$

Question 34

1 pts

Consider the elements lithium, oxygen, fluorine, and neon. Based on their position in the periodic table, which element would you expect to have the GREATEST tendency to attract a shared pair of electrons?

- neon
- lithium
- oxygen
- fluorine

Question 35

1 pts

The electronegativity of nonmetals is relatively _____ as compared to metals.

- Depends on the elements being compared.
- the same
- high
- low

Question 36

1 pts

Which of the following elements would be expected to have the highest electronegativity?

- He
- C
- Al
- N
- P
- Na

Question 37

1 pts

Generally speaking, in the periodic table, electronegativity (decreases, increases) when moving from left to right and (decreases, increases) when moving from top to bottom of the periodic table.

- decreases, decreases
- increases, decreases
- decreases, increases
- increases, increases

Question 38

1 pts

Which of the following bonds will be the most polar?

- C-H
- C-N
- S-F
- Cl-O

Question 39

1 pts

What is the difference in electronegativity between H and F?

- 0.63
- 1.78
- 0.95
- 3.80

Question 40

1 pts

Which bond is most polar?

- P-I
- P-Cl
- Cl-Cl
- I-Cl

Question 41

1 pts

Which substance has nonpolar covalent bonds?

- O_2
- NaCl
- CO
- NO_2

Question 42

1 pts

Which substance has polar covalent bonds?

- Ca_2C
- Cl_2
- O_2
- NH_3

Question 43

1 pts

You would expect a phosphorous-chlorine bond to be...

- nonpolar, with the phosphorous end having a partial negative charge.
- polar, with the chlorine end having a partial negative charge.
- nonpolar, with neither end having a partial charge.
- nonpolar, with the chlorine end having a partial negative charge.
- polar, with neither end having a partial charge.
- polar, with the phosphorous end having a partial negative charge.

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