

HW04 - Introduction to Compounds

1 4 points

Complete the sentence regarding the energy levels of an electron in the hydrogen atom. As the principal quantum number increases,

- the energy levels remain degenerate
- the spacing between successive energy levels remains constant
- the spacing between successive energy levels increases
- the spacing between successive energy levels decreases

2 4 points

Which of these atoms have unpaired electrons?

- oxygen
- neon
- nitrogen
- magnesium

3 4 points

How many total electrons are in the oxide anion?

- 4
- 6
- 12
- 10
- 8

4 4 points

The metal Ca and the nonmetal Br form an ionic bond. What is the formula for this ionic compound?

- CaBr₂
- Ca₂Br₃
- CaBr
- Ca₂Br
- Ca₃Br₂

5 4 points

Strontium (Sr) and chlorine (Cl) come together to make a bond. What type of compound is formed and what is its formula?

- Covalent, Sr₂Cl₂
- Ionic, SrCl
- Ionic, SrCl₂
- Covalent, SrCl₂

6 4 points

An example of iron oxidizing to form rust involves oxide forming an ionic compound with iron(III). What is the formula of this ionic compound?

- Fe₃O₂
- Fe₂O₃
- FeO₃
- Fe₂O₄
- FeO

7 4 points

Cobalt(II) forms an ionic compound with hydroxide. What is the formula for this compound?

- Co(OH)₂
- CoOH₂
- OH₂Co
- Co(OH)₃
- CoOH

8 4 points

What is the formula for magnesium phosphate?

- Mg₃(PO₃)₂
- Mg(PO₄)₂
- Mg₃(PO₄)₂
- Mg₃PO₄
- MgPO₄

9 4 points

What is the formula for sodium phosphite?

- Na₂PO₃
- NaPO₃
- Na₃PO₄
- Na(PO₃)₃
- Na₃PO₃

10 3 points

What is the name of Na₂S?

- sodium sulfate
- sodious sulfous
- sodium sulfide
- disodium sulfide
- disodium sulfurous
- sodium sulfite

11 4 points

Compared to a nonmetal in the same period, a metal is more likely to _____ its valence shell and form a _____.

- fill, cation
- empty, anion
- empty, cation
- fill, anion

12 4 points

Select the ionic compound with the strongest theoretical ionic bond strength.

- NaI
- KF
- NaF
- KCl

13 4 points

Select the ionic compound with the highest theoretical lattice energy.

- MgCl_2
- CaI_2
- MgI_2
- CaBr_2

14 3 points

A stronger ionic bond is typically associated with the ions having...

select all that apply

- larger ionic radii
- greater charge density
- larger charges
- smaller ionic radii

15 4 points

The range of atomic radii for small to large atoms is approximately...

- .5 to 300 Å
- 1 to 1000 Å
- 50 to 300 Å
- .5 to 3 Å
- 40 to 5000 Å

16 4 points

Which of the following best ranks the neutral elements P, Ge, and O from smallest to largest atomic radius?

- $\text{O} < \text{Ge} < \text{P}$
- $\text{Ge} < \text{P} < \text{O}$
- $\text{Ge} < \text{O} < \text{P}$
- $\text{P} < \text{O} < \text{Ge}$
- $\text{O} < \text{P} < \text{Ge}$

17 4 points

The smallest atomic radius in a particular period will be the...

- alkaline earth metal
- halogen
- noble gas
- alkali metal

18 4 points

Which of the following species is most likely to lose an electron to form a cation?

- Carbon
- Oxygen
- Sodium
- Fluorine

19 4 points

Which of the following is expected to have the highest electronegativity?

- Magnesium
- Sodium
- Chlorine
- Carbon

20 4 points

Hydrofluoric acid, HF, makes a polar covalent bond. Which of the following best describes the bond?

- There is an unequal sharing of electrons, resulting in a partial negative and partial positive
- There is an equal sharing of electrons, resulting in completely neutral charges on each atom
- There is an equal sharing of electrons, resulting in a partial negative and partial positive
- There is an unequal sharing of electrons, resulting in completely neutral charges on each atom

21 4 points

A bond between two nonmetals involves the sharing of electrons. However, one of the atoms has a higher electron affinity, meaning it attracts the electrons in the bond more than the other atom. What type of bond is this?

- Pure Covalent
- Polar covalent
- Ionic
- Metallic

22 6 points

Select all the covalent compounds below:

- Br_2
- H_2O
- CH_4
- NH_3
- CO_2
- LiBr
- CaO
- HCl

23 4 points

Select all the compounds below that have ionic bonds.

- NaCl
- CH_3OH
- HBr
- H_2O
- MgCl_2
- FeCl_3
- LiBr

24 4 points

Which type of bond is found in each of the following compounds?

HBr
 I_2
 LiBr

- HBr : ionic
 I_2 : covalent
 LiBr : covalent
- HBr : covalent
 I_2 : covalent
 LiBr : ionic
- HBr : ionic
 I_2 : covalent
 LiBr : ionic
- HBr : covalent
 I_2 : ionic
 LiBr : covalent

25 4 points

What are the bonds in the following molecules?

HCl
 Br_2
 KCl

- HCl : covalent
 Br_2 : covalent
 KCl : ionic
- HCl : ionic
 Br_2 : covalent
 KCl : covalent
- HCl : ionic
 Br_2 : ionic
 KCl : covalent
- HCl : ionic
 Br_2 : covalent
 KCl : ionic