

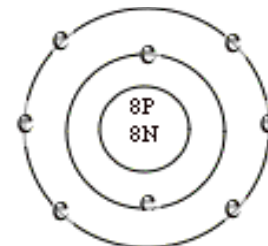
Name: _____

Date: _____

Chemistry Term 2 Review

1) Using the diagram above, answer the following question: How many electrons are in the valence shell of this atom?

- A. 2
- B. 3
- C. 6
- D. 10
- E. 13



2) Which formula represents an ionic compound?

- A. NaCl
- B. N₂O
- C. HCl
- D. H₂O

3) If M represents a group 1 metal, what is the most likely formula for the compound formed with M and oxygen?

- A. MO₂
- B. M₂O
- C. M₂O₃
- D. M₃O₂

4) What is the total number of electrons in the valence shell of an atom of aluminum in the ground state?

- A. 8
- B. 2
- C. 3
- D. 10

5) Metallic bonding occurs between atoms of:

- A. sulfur
- B. copper
- C. fluorine
- D. carbon

6) Which pair of atoms is held together by a covalent bond?

- A. NaCl
- B. LiCl
- C. KCl
- D. HCl

7) Which type of bond is formed when an atom of potassium transfers an electron to a bromine atom?

- A. metallic
- B. ionic
- C. nonpolar covalent
- D. polar covalent

8) Which atom has five valence electrons in the ground state?

- A. C
- B. Cl
- C. Si
- D. P

9) When an atom loses an electron, the atom becomes an ion that is

- A. positively charged and gains an insignificant amount of mass
- B. positively charged and loses an insignificant amount of mass
- C. negatively charged and gains an insignificant amount of mass
- D. negatively charged and loses an insignificant amount of mass

10) Given the electron dot diagram: The electrons in the bond between hydrogen and fluorine are more strongly attracted to the atom of

- A. hydrogen, which has the higher electronegativity
- B. fluorine, which has the higher electronegativity
- C. hydrogen, which has the lower electronegativity
- D. fluorine, which has the lower electronegativity



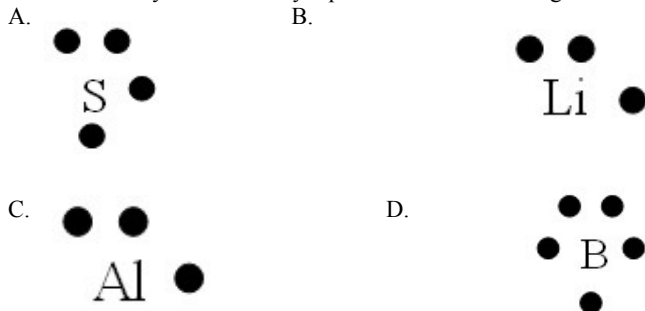
11) Using a periodic table, answer the following question: Which series of elements have the same number of valence electrons?

- A. Mg, Co, Bi, Rn
- B. Sn, Pb, F, I
- C. Ca, Sr, Cu, Ag
- D. Na, Mg, Si, P
- E. N, P, Sb, Bi

12) Element X is in Group 2 and element Y is in Group 17. What happens when a compound is formed between these two atoms?

- A. X loses electrons to Y to form an ionic bond
- B. X loses electrons to Y to form a covalent bond
- C. X gains electrons from Y to form an ionic bond
- D. X gains electrons from Y to form a covalent bond

13) Which electron-dot symbol correctly represents an atom of its given element?



14) Which statement best describes the substance that results when electrons are transferred from a metal to a nonmetal?

- A. It contains ionic bonds and has a low melting point
- B. It contains ionic bonds and has a high melting point
- C. It contains covalent bonds and has a low melting point
- D. It contains covalent bonds and has a high melting point

15) Which of the following atoms has the greatest tendency to attract electrons?

- A. barium
- B. beryllium
- C. boron
- D. bromine

16) The atoms of the elements in the same group have the same _____.

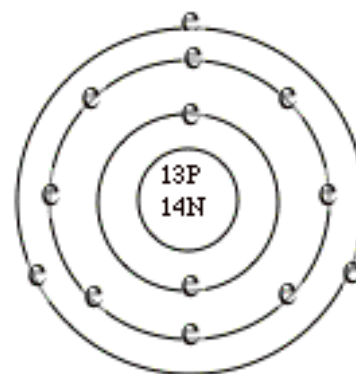
- A. mass number
- B. atomic number
- C. number of protons
- D. number of valence electrons

17) Atoms of metals tend to

- A. lose electrons and form negative ions
- B. lose electrons and form positive ions
- C. gain electrons and form negative ions
- D. gain electrons and form positive ions

18) Using the diagram above, answer the following question: How many electrons are in the valence shell of this atom?

- A. 2
- B. 3
- C. 8
- D. 10
- E. 13



19) What is the formula for the compound named sodium sulfate?

- A. NaSO
- B. Na₂SO
- C. Na₂SO₄
- D. S₂SO₄
- E. SSO₄

20) What is the name of the compound with the formula Na₂PO₄?

- A. nickel phosphate
- B. nitrogen phosphate
- C. nitrogen phosphorus oxygen
- D. sodium phosphate
- E. sodium phosphorus oxygen

21) What is the name of the compound with the formula K₂PO₄?

- A. calcium phosphate
- B. calcium Phosphorus oxygen
- C. krypton phosphate
- D. potassium phosphate
- E. potassium phosphorus oxygen

22) What is the formula for potassium nitrate?

- A. KNO
- B. KNO₃
- C. kno
- D. PN
- E. PNO

Some Polyatomic Ions

Name	Formula
Chlorate	ClO ₃ ⁻
Cyanide	CN ⁻
Hydroxide	OH ⁻
Nitrite	NO ₂ ⁻
Carbonate	CO ₃ ²⁻
Sulfate	SO ₄ ²⁻
Phosphate	PO ₄ ³⁻

Rules for Naming Transitional Metal Salts

1. The name of the metal is unchanged.
2. For metals having more than one oxidation state, a Roman numeral in parenthesis indicates the oxidation state of the metal.
3. The anion is named by adding -ide to the stem of the element.

- 23) Using these rules, answer the following question: What is the proper name for $ZnCl_2$?
- A. Zinc Chloride
 - B. Zinc (I) Chloride
 - C. Zinc (II) Chloride
 - D. Zinc (III) Chloride
 - E. Zinc Chlorine
- 24) Using these rules, answer the following question. What is the formula for Iron (II) sulfide?
- A. FeS
 - B. Fe_2S
 - C. FeS_2
 - D. Fe_2S_2
 - E. Fe_2S_3
- 25) Using these rules, answer the following question. What is the proper name for Cr_2O_3 ?
- A. Chromium (II) oxide
 - B. Chromium (III) oxide
 - C. Chromium trioxide
 - D. Dichromium trioxide
 - E. Chromium oxide
- 26) Sue is studying a compound. She finds that the compound is made of silver, nitrogen and oxygen. Further analysis shows that for every atom of silver in the compound there is one atom of nitrogen and three atoms of oxygen. What is the formula for the compound?
- A. SNO_3
 - B. SNO
 - C. Sno
 - D. $AgNO_2$
 - E. $AgNO_3$
- 27) Given the following formula $Al_2(SO_4)_3$ what is the ratio of aluminum atoms to oxygen atoms?
- A. 1:4
 - B. 1:5
 - C. 1:6
 - D. 3:4
 - E. 3:8
- 28) Which of the following best describes the relationship between compounds and the elements they are made from?
- A. The properties of a compound are the same as those of the elements from which it is formed.
 - B. The properties of a compound are different from those of the elements or compounds from which it is formed.
 - C. The properties of a compound cannot be different from those of the elements or compounds from which it is formed.
 - D. The properties of a compound are unrelated to the elements or compounds from which it is formed.
- 29) Gary is studying a compound. He finds that the compound is made of calcium, carbon and oxygen. Further analysis reveals that for every calcium atom he has one carbon atom and three oxygen atoms. What is the formula for this compound?
- A. Ca_2CO_3
 - B. $CaCO_3$
 - C. $CaCO_4$
 - D. $CoCa_2$
 - E. OCaC
- 30) The chemical formula for nickel (II) bromide is
- A. Ni_2Br
 - B. $NiBr_2$
 - C. N_2Br
 - D. NBr_2
- 31) Given the following formula $Ca_3(PO_4)_2$ what is the ratio of calcium atoms to oxygen atoms?
- A. 1:4
 - B. 1:5
 - C. 2:4
 - D. 3:4
 - E. 3:8
- 32) Use a periodic table to answer the following question: Which is the correct chemical formula for Iron (III) chloride?
- A. Fe_3Cl
 - B. $FeCl_3$
 - C. I_3Cl
 - D. ICl_3
 - E. $PbCl_3$

- 33) Which of the following contains properties of metals only?
- conductor, brittle, low melting point, lustrous
 - non conductor, brittle, low melting point, lustrous
 - malleable, conductor, high melting point, lustrous
 - non conductor, brittle, high melting point, lustrous
 - non conductor, brittle, high melting point, non lustrous

34) A chemist performs the same tests on two white crystalline solids, A and B. The results are shown in the table below.

The results of these tests suggest that:

- both solids contain mostly ionic bonds
- both solids contain mostly covalent bonds
- A contains covalent bonds and solid B contains ionic bonds
- A contains ionic bonds and solid B contains covalent bonds

	Solid A	Solid B
Melting Point	High, 80°C	Low, decomposes at 186°C
Solubility in H ₂ O (grams per 100.0 g in H ₂ O at 0°C)	35.7	3.2
Electrical Conductivity (in aqueous solution)	Good conductor	Nonconductor

35) Which molecule is polar and contains polar bonds?

- CCl₄
- CO₂
- N₂
- NH₃

36) The table below shows four compounds and the boiling point of each.

Which type of molecular attraction accounts for the high boiling point of H₂O?

- molecule-ion
- ion-ion
- hydrogen bonding
- van der Waals forces

Compound	Boiling Point
H ₂ O	100.°C
H ₂ S	-60.7°C
H ₂ Se	-41.5°C
H ₂ Te	-2.2°C

37) Which molecule has an asymmetrical shape?

- N₂
- NH₃
- Cl₂
- CCl₄

38) The properties of water are vitally important to all living things on Earth. What properties of water allow it to exist as a liquid in oceans and rivers?

- Its polarity allows it to remain a liquid when other substances are solid.
- Most temperatures on Earth are in between its freezing and boiling point.
- Its freezing point allows ice to have a lower density than liquid water.
- Its molecules are in constant motion, allowing for evaporation and condensation.

39) Given: Becky is conducting an experiment in which she measures 30 ml of an acid of unknown concentration. She adds an indicator solution to it, then slowly adds a basic solution of a known concentration from a buret until the acid solution is neutralized. She measure and records the pH of the solution periodically throughout the experiment. What laboratory technique is Becky using?

- electrolysis
- distillation
- titration
- electrophoresis

40) When compared to H₂S, H₂O has a higher boiling point because H₂O contains stronger

- metallic bonds
- covalent bonds
- ionic bonds
- hydrogen bonds

41) Which reaction occurs when equivalent quantities of H⁺ (or H₃O⁺) and OH⁻ are mixed?

- reduction
- oxidation
- neutralization
- hydrolysis

42) Given the equation: 2C₂H₂(g) + 5O₂(g) --> 4CO₂(g) + 2H₂O(g) How many moles oxygen will react with 1.0 mole C₂H₂?

- 5.0
- 2.5
- 2.0
- 10

43) Which reaction represents the process of neutralization?

- Pb(NO₃)₂(aq) + CaCl₂ --> Ca(NO₃)₂(aq) + PbCl₂(s)
- Mg(s) + 2HCl(aq) --> MgCl₂(aq) + H₂(g)
- HCl(aq) + KOH(aq) --> KCl(aq) + H₂O(l)
- 2KClO₃(s) --> 2KCl(s) + 3O₂(g)

- 44) Given the unbalanced equation: $\underline{\quad}\text{Al(s)} + \underline{\quad}\text{O}_2\text{(g)} \rightarrow \underline{\quad}\text{Al}_2\text{O}_3\text{(s)}$
 When this equation is correctly balanced using *smallest* whole numbers, what is the coefficient of $\text{O}_2\text{(g)}$?
- 6
 - 4
 - 3
 - 2
- 45) Use the periodic table to find the molar mass for Na_2SO_4
- 71.05 grams/mole
 - 22.99 grams/mole
 - 149.03 grams/mole
 - 142.04 grams/mole
 - 119.05 grams/mole
- 46) If equal volumes of 0.1 M NaOH and 0.1 M HCl are mixed, the resulting solution will contain a salt and
- NaOH
 - NaCl
 - HCl
 - H_2O
- 47) Given the equation: $2\text{Na} + \text{S} \rightarrow \text{Na}_2\text{S}$ What is the total number of moles of S that reacted when 4.0 moles of Na were consumed?
- 4.0 moles
 - 2.0 moles
 - 1.0 mole
 - 0.5 mole
- 48) When butane burns in an excess of oxygen, the principal products are
- CO_2 and H_2O
 - CO_2 and H_2
 - CO and H_2O
 - CO and H_2
- 49) Given the reaction: $\text{C}_6\text{H}_{12}\text{O}_6\text{(s)} + 6\text{O}_2\text{(g)} \rightarrow 6\text{CO}_2\text{(g)} + 6\text{H}_2\text{(l)}$
 How many moles of $\text{C}_6\text{H}_{12}\text{O}_6$ are needed to produce 24 moles of carbon dioxide?
- 4.0 moles
 - 24 moles
 - 12 moles
 - 1.0 moles
- 50) Given the unbalanced equation: $\underline{\quad}\text{Al} + \underline{\quad}\text{CuSO}_4 \rightarrow \underline{\quad}\text{Al}_2\text{(SO}_4)_3 + \underline{\quad}\text{Cu}$ When, what is the coefficient of Al?
- 4
 - 3
 - 2
 - 1
- 51) Which of the following provides the correct coefficients to balance the following chemical equation? $\underline{\quad}\text{Fe} + \underline{\quad}\text{O}_2 \rightarrow \underline{\quad}\text{Fe}_2\text{O}_3$
- 4, 3, 2
 - 4, 2, 3
 - 3, 3, 2
 - 2, 6, 2
 - 2, 3, 1
- 52) Which equation is correctly balanced?
- $\text{H}_2 + \text{O}_2 \rightarrow \text{H}_2\text{O}$
 - $\text{Ca} + \text{Cl}_2 \rightarrow \text{CaCl}$
 - $\text{Ca} + \text{Cl}_2 \rightarrow \text{Ca}_2\text{Cl}$
 - $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$
- 53) Which of the following provides the correct coefficients, listed in order, to balance the following chemical equation?
 $\underline{\quad}\text{Al(NO}_3)_3 + \underline{\quad}\text{H}_2\text{SO}_4 \rightarrow \underline{\quad}\text{Al}_2\text{(SO}_4)_3 + \text{HNO}_3$
- 2, 2, 3, 3
 - 2, 3, 3, 2
 - 2, 3, 1, 6
 - 3, 2, 4, 3
 - 3, 2, 3, 2
- 54) Calcium deposits form on the surfaces of water faucets in many homes. What chemical reaction could remove them?
- an acid would chemically react with and dissolve the minerals
 - a plastic scrub pad could rub against and loosen them
 - soap could dissolve the minerals and clean the surface
 - water could dissolve the minerals if the faucets are soaked in it

- 55) A student is asked to balance the chemical equation: $\text{Ca(OH)}_2 + \text{HCl} \rightarrow \text{CaCl}_2 + \text{H}_2\text{O}$
 He does this by removing the 2 after the Ca(OH) and after the (CaCl). Is this the correct way to balance an equation? Why?
- No, the numbers should be changed to 3's
 - No, changing the number changes the compounds
 - No, a 2 should be put in between H and Cl in H_2Cl
 - Yes, this is the easiest way to balance equations
 - Yes, it doesn't matter where the numbers go
- 56) Given the unbalanced equation: $__\text{Fe}_2\text{O}_3 + __\text{CO} \rightarrow __\text{Fe} + __\text{CO}_2$
 When the equation is correctly balanced using the smallest whole-number coefficients, what is the coefficient of CO?
- 4
 - 3
 - 2
 - 1
- 57) Oil found deep underground has been formed through a variety of chemical reactions over many millions of years. Scientists are trying to understand the reactions that have taken place. What assumption must be made to recreate this process?
- Chemical reactions take place the same way today as they did in the past.
 - Chemical reactions are taking place all the time in all parts of the world.
 - Chemical reactions can only happen when scientifically measured.
 - Chemical reactions are an important part of how the world has evolved.
- 58) Given the reaction: $\text{Cl}_2(\text{g}) + \text{Cl}(\text{g}) \rightarrow \text{Cl}_3(\text{g}) + \text{energy}$ Which statement best describes the action?
- A bond is formed and energy is absorbed
 - A bond is broken and energy is released
 - A bond is broken and energy is absorbed
 - A bond is formed and energy is released
- 59) How many moles of solute are contained in 200 milliliters of a 1M solution?
- 200
 - 1
 - 0.8
 - 0.2
- 60) Using the periodic table find the molar mass for $\text{Al}_2(\text{SO}_4)_3$.
- 75.04 grams/mole
 - 278.01 grams/mole
 - 150.02 grams/mole
 - 123.04 grams/mole
- 61) When an oxidation-reduction reaction occurs, there must be a transfer of
- protons
 - neutrons
 - ions
 - electrons
- 62) Given the reaction: $6\text{CO}_2 + 6\text{H}_2 \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$ How many moles of water are needed to make 2.5 moles of $\text{C}_6\text{H}_{12}\text{O}_6$?
- 6.0
 - 2.5
 - 15
 - 12
- 63) Benzene is not soluble in water. The normal freezing point of benzene is 5.5°C . The normal freezing point of water is 0.0°C . What would the freezing point of water be if 10 milliliters of water were mixed with 10 milliliters of benzene?
- 5.5°C
 - 2.75°C
 - 0.0°C
- 64) As the pressure on the surface of a liquid *decreases*, the temperature at which the liquid will boil:
- decreases
 - increases
 - remains the same
- 65) Which of the following is a way people use an understanding of colligative properties? (colligative = solutions)
- using antifreeze in a car's radiator to lower the freezing point of water
 - boiling the fractions out of crude oil
 - building a battery that will recharge when the car is moving
 - using enzymes to remove the stains from a fabric
- 66) Chloroform is not soluble in water. The normal freezing point of chloroform is 63.5°C . The normal freezing point of water is 0.0°C . What would the freezing point of water be if 10 milliliters of water were mixed with 10 milliliters of chloroform?
- 63.5°C
 - 31.75°C
 - 0.0°C
 - 47.2°C