

Name: _____ANSWERS_____

Date: _____

BCI SCIENCE

SNC 2D

Chemistry Review

A. Fill in the blanks (use the following list)

| | | | | | |
|---------------|--------------|----------------|-------------|-------------|------------|
| acid | base | catalyst | chemical | coefficient | combustion |
| concentration | displacement | electrolyte | endothermic | indicator | ionization |
| litmus | negative | neutralization | pH | polyatomic | rate |
| reactants | synthesis | | | | |

1. A **_chemical_** property is one that involves the production of a new substance.
2. The starting materials in chemical reactions are called **_reactants_**.
3. The electron is a subatomic particle that has a **_negative_** charge.
4. An ion that contains more than one atom is called a **_polyatomic_** ion.
5. The number written in front of a chemical compound is called a **_coefficient_**.
6. The burning of a substance is called **_combustion_**.
7. A reaction between elements is a **_synthesis_** reaction.
8. The speed at which a reaction occurs is the **_rate_** of reaction.
9. A reaction that absorbs heat is called **_endothermic_**.
10. Water, gas, or solid products are clues that a double **_displacement_** reaction has occurred.
11. A(n) **_acid_** is a substance that when dissolved in water ionizes to form H^+ ions and anions.
12. The **_pH_** scale is used to determine the degree of acidity or alkalinity.
13. Increasing the **_concentration_** of a solution will increase the amount of collisions.
14. When an ionic substance is dissolved in water it undergoes the process of **_ionization_**.
15. A(n) **_base_** is a substance that when dissolved in water ionizes to form cations and OH^- ions.
16. An aqueous solution that is capable of conducting electricity is known as a(n) **_electrolyte_**.
17. A substance that speeds up chemical reactions is called a **_catalyst_**.
18. Water and salt are the products of a **_neutralization_** reaction.
19. A(n) **_indicator_** is a substance that changes colour at a specific pH range.
20. Blue **_litmus_** paper turns red in an acid.

B. True or False (If the statement is **false**, REWRITE the statement to make it **true**)

21. Compounds that contain carbon and hydrogen are called ~~ionic~~ compounds.

F **covalent**

22. ~~Covalent~~ compound chemical formulas show a lowest terms ratio of elements.

F **Ionic**

23. Another term for bonding capacity is ~~oxidation number~~.

F **valence**

24. An alkaline earth metal element forms an ion with a ~~1+~~ ionic charge.

F **-2**

25. A skeleton equation describes only the ~~names~~ of the reactants and products.

F **formulas**

26. The Law of Conservation of Mass states that the numbers of atoms of reactants and products must be the same.

T

27. The reaction of barium nitrate and sodium sulphide would be a double displacement reaction.

T

28. Grinding a solid into a dust increases its surface area.

T

29. A strong base and a weak base could have the same pH level.

T - **DILUTE strong base and a CONCENTRATED weak base**

30. An acid with a pH of 2 is 20 times stronger than an acid with a pH of 4.

T

31. Each 1 unit on the pH scale represents a tenfold increase in concentration.

T

32. Decreasing the surface area of a reactant would ~~increase~~ the rate of reaction.

F **decrease**

33. Increasing the concentration of the reactants would increase the rate of reaction.

T

34. Decreasing the temperature of the reaction would ~~increase~~ the rate of reaction.

F **decrease**

35. Phenolphthalein turns pink in an ~~acid~~.

F **base**

54. Give 5 characteristic properties of both acids and bases.

| PROPERTY | ACID | BASE |
|------------------|------------------------------|-------------|
| pH | 0-7 | 7-14 |
| taste | sour | bitter |
| feel | No characteristic feel | slippery |
| Conductivity | yes | yes |
| Litmus | Blue to red | Red to blue |
| Bromothymol Blue | Blue to yellow | Stays blue |
| Phenolphthalein | clear | pink |
| Carbonates | CO ₂ gas produced | No reaction |

E. Naming (fill in the following chart)

| Name | Formula |
|------------------------|------------------------------------|
| SODIUM BROMIDE | NaBr |
| lithium phosphate | Li ₃ PO ₄ |
| MAGNESIUM IODIDE | MgI ₂ |
| calcium carbonate | CaCO ₃ |
| CALCIUM NITRATE | Ca(NO ₃) ₂ |
| silver iodide | AgI |
| IRON(III)CHLORIDE | FeCl ₃ |
| aluminum bromide | AlBr ₃ |
| POTASSIUM SULPHATE | K ₂ SO ₄ |
| phosphorus trichloride | PCl ₃ |
| CARBON TETRABROMIDE | CBr ₄ |
| dinitrogen pentoxide | N ₂ O ₅ |
| TIN(IV)SULPHIDE | SnS ₂ |
| lead(II)oxide | PbO |
| HYDROCHLORIC ACID | HCl _(aq) |
| nitric acid | HNO _{3(aq)} |
| PHOSPHORIC ACID | H ₃ PO _{4(aq)} |
| magnesium hydroxide | Mg(OH) _{2(aq)} |

55. Define rate of reaction. Explain how each of the following factors affects the overall rate of a chemical reaction:

| | | | |
|---|---|--|---|
| Rate: the speed of the reaction | | | |
| a) concentration | b) catalysts | c) temperature | d) surface area |
| - the amount of molecules in a given space. ↑ concentration results in ↑ collisions and a faster Rate | - speed up rate of reaction by reducing activation energy. Not used up in a reaction. | - average speed of molecules in a system. ↑ temp. ↑ effective collisions = ↑ rate. | -amount of exposed molecules. ↑ SA = ↑ rate |

F. Balancing (balance the following equations and identify the type of reaction)

56. $\text{Br}_{2(g)} + 2\text{KI}_{(aq)} \rightarrow 2\text{KBr}_{(aq)} + \text{I}_{2(g)}$ Type: single displacement
57. $3\text{Sr}_{(s)} + \text{N}_{2(g)} \rightarrow \text{Sr}_3\text{N}_{2(s)}$ Type: synthesis
58. $\text{K}_2\text{O}_{(s)} + \text{H}_2\text{O}_{(l)} \rightarrow 2\text{KOH}_{(aq)}$ Type: synthesis
59. $\text{SO}_{3(g)} + \text{H}_2\text{O}_{(l)} \rightarrow \text{H}_2\text{SO}_{4(aq)}$ Type: synthesis
60. $2\text{Al}(\text{OH})_{3(aq)} + 3\text{H}_2\text{SO}_{4(aq)} \rightarrow \text{Al}_2(\text{SO}_4)_{3(aq)} + 6\text{H}_2\text{O}_{(l)}$ Type: double displacement / neutralization
61. zinc + iron(III)nitrate \rightarrow iron + zinc nitrate Type: single displacement
- $3\text{Zn} + 2\text{Fe}(\text{NO}_3)_3 \rightarrow 2\text{Fe} + 3\text{Zn}(\text{NO}_3)_2$
62. magnesium carbonate \rightarrow magnesium oxide + carbon dioxide Type: decomposition
- $\text{MgCO}_3 \rightarrow \text{MgO} + \text{CO}_2$
63. silver nitrate + calcium iodide \rightarrow silver iodide + calcium nitrate Type: double displacement
- $2\text{AgNO}_3 + \text{CaI}_2 \rightarrow 2\text{AgI} + \text{Ca}(\text{NO}_3)_2$
64. potassium + oxygen \rightarrow potassium oxide Type: synthesis
- $4\text{K} + \text{O}_2 \rightarrow 2\text{K}_2\text{O}$
65. hydrochloric acid + barium hydroxide \rightarrow water + barium chloride Type: double displacement / neutralization
- $2\text{HCl} + \text{Ba}(\text{OH})_2 \rightarrow 2\text{H}_2\text{O} + \text{BaCl}_2$

G. Bonding (Using electron dot diagrams, show how the following molecules are formed)

66.

| Bonding Atoms | EDD | EDD | Formation of Bond (Movement of Electrons) | Ions formed |
|---------------------|---------------------|--------------------|--|---|
| Lithium and sulphur | Li^\bullet | $\ddot{\text{S}}:$ | | $2 [\text{Li}]^{+1} \quad [\ddot{\text{S}}]^{2-}$ |

67.

| Bonding Atoms | EDD | EDD | Formation of Bond (Movement of Electrons) | Ions formed |
|---------------------|-----------------------|-----------------------------|--|--|
| Aluminum and oxygen | $\cdot\text{Al}\cdot$ | $\cdot\ddot{\text{O}}\cdot$ | | $2[\text{Al}]^{+3} [\ddot{\text{O}}]^{2-}$ |

68.

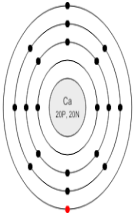
| Covalent Molecule | Atom EDD | Atom EDD | Compound EDD | Structural Diagram |
|-------------------|-----------------------------|------------------------------|--------------|---|
| OBr_2 | $\cdot\ddot{\text{O}}\cdot$ | $\cdot\ddot{\text{Br}}\cdot$ | | $\ddot{\text{Br}} - \ddot{\text{O}} - \ddot{\text{Br}}$ |

69.

| Covalent Molecule | Atom EDD | Atom EDD | Compound EDD | Structural Diagram |
|-------------------|-----------------------------|-----------------------------|--------------|---|
| CO_2 | $\cdot\ddot{\text{C}}\cdot$ | $\cdot\ddot{\text{O}}\cdot$ | | $\ddot{\text{O}} = \ddot{\text{C}} = \ddot{\text{O}}$ |

H. Diagrams (Draw Bohr-Rutherford Diagrams for the following)

70. Calcium, Ca



71. Aluminum

