Sc 20F Chemistry unit review Key

An overview

1. Recognize the difference between a physical change and a chemical change
2. Understand the Bohr model as it relates to the structure of the atom (nucleus, protons, electrons, neutrons, energy levels)
3. Draw the Lewis structure
4. Assign oxidation numbers to atoms based on their location in the periodic table
5. Understand the difference between ionic and molecular compounds, ionic and covalent bonds
6. Nomenclature
7. Balancing equations
8. Types of reactions (single displacement, double displacement, synthesis, decomposition, combustion)
9. Recognize a base or an acid, based on characteristics and pH

Questions to work on:

1. Fill the blanks:

a. A compound is formed of two, or many elements

b. A mixture in which a solid is dissolved in a liquid is called a solution

c. A substance that is dissolved by the solvent is called a solute.

d. A heterogeneous mixture in which a liquid is mixed with another liquid is called a solution

e. A solution is a homo/heter mixture.

f. When we cannot dissolve anymore solute in a solution, we say the solution is saturated.

g. A type of element that is a good conductor of electricity metal.

h. A carbon atom has 4 valence electrons.

i. Nitrogen is a (an) non metal element.

j. Argon is a noble gas.

k. Calcium is in period 4.

l. Aluminum is in family (group) 3A

m. Fusion is an synthesis reaction.

n. Condensation is an decomp reaction.

o. A base produces OH^- ions in solution.

p. An acid produces H^+ ions in solution.

q. When a base reacts with an acid, they produce a salt and water.

r. An acid has a pH below 7.

s. An indicator changes color when mixed with a base or an acid.

t. A /an Covalent bond is formed between two non-metals.

u. A/an metallic compound has a high fusion point.

v. A metalloid has properties of both metals and non-metals.

w. A proton has a mass, of and a charge of +ve

x. A neutron has a mass of 1amu and a charge of nothing.

y. An electron has a mass of .000 -. and a charge of -ve.

z. The octet rule explains the stability of elements that possess 8 valence electrons.

2. Are the following elements M(metals), NM(non-metals), or D(metalloids)

a. Sc: M

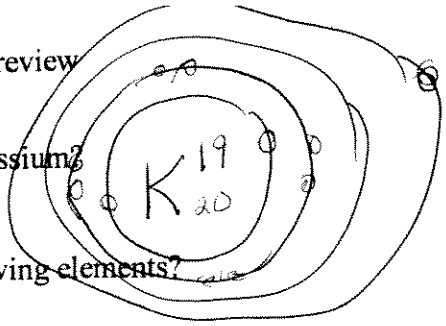
b. Se: NM

c. As: NM

d. Ar: NM

e. Au: M

3. What is the Bohr model for the element, potassium?



4. What is the name or the symbol for the following elements?

a. B: Boron

b. N: Nitrogen

c. Magnesium: Mg

d. Sodium: Na

5. What is the Lewis structure for Silicon? Si

6. What is the element that is in period 2 and in family IVA? Carbon

7. If an element has a mass of 35 and its atomic number is 17:

a. How many protons? 17

b. How many neutrons? 18

c. How many electrons? 17

d. What is the element? Cl

8. What are the ions formed by the following elements?

a. Nitrogen: N^{3-}

b. Helium: He^{+}

c. Sodium: Na^{+}

d. Barium: Ba^{2+}

e. Chlorine: Cl^{-}

9. Ca^{+2}.

a. a cation or an anion? _____

b. how many electrons does it have? 18

c. how many protons does it have? 20

d. how many neutrons does it have? 20

10. Write the formulas/names of the following compounds:

a. copper (I) nitrate: $CuNO_3$

b. mercury (II) bromide: $HgBr_2$

c. nickel (III) sulfide: Ni_2S_3

d. N_2O_5: dinitrogen pentoxide

e. Al_2O_3: aluminum oxide

f. $FeCl_2$: iron(II) chloride

11. a. Balance the following reactions.
b. Indicate what type of reaction it is.

A. 2 $NaClO_3(s) \rightarrow$ 2 $NaCl(s)$ + 3 $O_2(g)$

B. Type decomp

C. 3 $H_2SO_4(aq)$ + ____ $Al_2O_3(s)$ + → ____ $Al_2(SO_4)_3(aq)$ + 3 $H_2O(l)$

D. Type D.R.

E. 2 $Zn(s)$ + ____ $FeCl_2(aq)$ → ____ $ZnCl_2(aq)$ + 2 $Fe(s)$

F. Type: S.R.

11. If a solution has more H^+ than OH^-, it is described, as: acidic, basic or neutral?

12. Use IUPAC rules to name or write the formula for each of the following compounds:

1. N_2O_5 dinitrogen pentoxide
2. $Fe(NO_3)_3$ iron(III) nitrate
3. $PbCO_3$ lead (II) carbonate
4. K_3N potassium nitride

5. $Ca(OH)_2$ Calcium hydroxide
6. NaH Sodium hydride
7. CBr_4 carbon tetrabromide
8. SCl_2 Sulfur trichloride
9. $MgSO_4$ Magnessium sulfate
10. NH_4F ammonium fluoride
11. calcium bromide $CaBr_2$
12. iron(II) iodide FeI_2
13. aluminum sulfide Al_2S_3
14. sodium phosphate Na_3PO_4

13. Find the molar mass of the following compounds.

1. N_2O_5 108
2. $Fe(NO_3)_3$ 241.85
3. $PbCO_3$ 267.21
4. $Ca(OH)_2$ 74.08
5. SCl_2 102.97
6. $MgSO_4$ 120.38
7. NH_4F 37.0416
8. N_2O_5: 108
9. Al_2O_3: 101.96