**Review for Final – General, 2023-24 School Year Answers**

Here are the answers. I hope you enjoy them and find them useful in your studies!

1. 0.282 moles (the molar mass of CuSO4 is 159.6 g/mol)

2. 243.8 grams (the molar mass of Li2CO3 is 73.9 g/mol)

3. 3, 1, 3, 1

1, 8, 8

2, 3, 1, 6

1, 9, 6, 6

4) All of the reactions will occur. The first reaction is an acid-base reaction, the second is a synthesis reaction, the third is an acid-base reaction, and the fourth is a combustion reaction.

5) H2CO3 → CO2(g)  + H2O(l) ΔH = -

6) Using PV = nRT, we find that (1.00 atm)V = (1.50 mol)(0.08206 Latm/molK)(298K), which gives us a volume of 36.7 liters

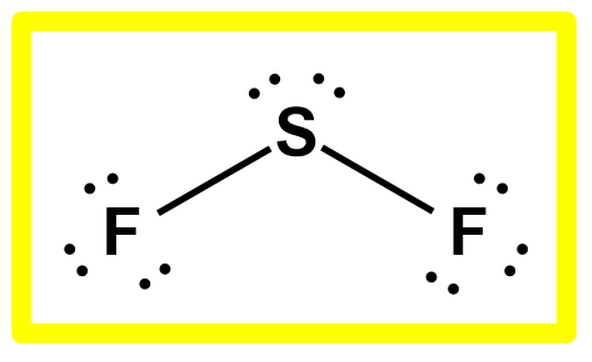
7) This is a combined gas law problem, where pressure is ignored. This gives us an answer of 44.2 L.

8,9) There’s no real answer key I can give you for these. However, if you want to know whether you did your questions correctly, email me your answers.

10) Gas particles are infinitely small – reasonable because gas particles are really small and really far away from each other. Gas particles move in constant, random motion – this is true. The kinetic energies of gas particles is proportional to their temperature in Kelvin – this is also true. Gas molecules experience no intermolecular forces – because they are so far apart from each other and moving so fast, the really don’t interact much.

11) Valence electrons repel each other. This explains why the lone pairs and atoms bonded in covalent compounds move as far away from each other as possible.

12)



a)

b) tetrahedral (if you said bent, that’s also good)

c) 109.5 degrees (if you said 104.5 degrees, that’s good, too)

d) The dipole arrow points straight down in this diagram, indicating that the side with the fluorine atoms attracts negative charge.

13) Ionic compounds involves a transfer of electrons to make positively charged cations an negatively charged anions, while covalent bonding involves shared electrons.

14) Low melting and boiling point, soft and squishy, flammable, poor conductivity, poor solubility in water. These are mainly due to the fact that covalent compounds exist as molecules that don’t really interact with each other much, so they’re easy to move around.

15) Valence shell electron pair repulsion. It tells us that the outer electrons in a covalent compound (lone pairs and bonds) repel each other to get as far away from each other as posslble. The shapes of covalent compounds are determined by this repulsion.

16) a) 2, 1, 2, 1

b) Double displacement

c) Yes. Both reagents are soluble and only one product is soluble

d) 33.6 grams (The amount that’s made from the limiting reagent, which is lead (II) nitrate. Sodium chloride, on the other hand, would have made 36.0 grams).

e) lead (II) nitrate

f) 15 – 15 (33.6/36.0) = 1.0 grams

g) 25/33.6 x 100% = 74%. This is reasonable.

17) covalent bond: two shared electrons between two atoms; molecule: two or more atoms bonded covalently; mole: 6.02 x 1023 things; stoichiometry: The method we use to figure out how much stuff we can make in a reaction or how much stuff we’ll need to perform it in the first place; molar mass: The mass of one mole of something; polarity: When charge is separated out into different parts of a bond or molecule; VSEPR: Electrons like to stay far apart from each other; pressure: The force of gas molecules hitting things; temperature: A measure of the kinetic energy of particles; volume: how much space something occupies; aqueous: dissolved in water; solubility: how much something dissolves in water; single displacement reaction: When an element takes the place of an element in a chemical compound; double displacement reaction: When the cations of two ionic compounds switch places; synthesis: chemical reactions where several reagents make one product; decomposition: One chemical compound breaks apart into several; acid-base reaction: reaction where an acid and base combine to make water and an ionic compound; combustion: something with C and H react with oxygen to form carbon dioxide and water; exothermic: Giving off energy; endothermic: Absorbing energy; limiting reagent: In a reaction, the reagent you run out of first; excess reagent: in a reaction, the one you don’t run out of; Lewis structure: A picture showing all of the atoms and electrons in a covalent compound; lone pair: two electrons that belong only to one atom; double bond: Two pairs of electrons being shared between two atoms; bond angle: The angles between two covalent bonds in a compound; ideal gas: A gas that behaves according to the kinetic molecular theory; ideal gas law: PV = nRT; combined gas law: P1V1/T1 = P2V2/T2; nonpolar: When there’s no separation of + or - charge