REVIEW SHEET Key NOMENCLATURE EARLY ATOMIC THEORY

1. Write the atomic symbols for isotopes with the following characteristics. Express your answer as an isotope $$ (12 points).
2. 27 protons and 32 neutrons $$
3. a neon atom with twelve neutrons $$
4. a mass number of 24 and 13 neutrons $$
5. a titanium cation with 25 neutrons and 19 electrons $^{3+}$
6. Silver has two isotopes. Silver-107 has an atomic mass of 106.91 amu and percent abundance of 51.84%. What is the atomic mass of silver-109 if it has a percent abundance of 48.16% (10 points)?

$$atomic mass=\left(mass 1\right)\left(\frac{\% abundance 1}{100\%}\right)+ \left(mass 2\right)\left(\frac{\% abundance 2}{100\%}\right)+…$$

$$107.87 amu=\left(106.91 amu\right)\left(\frac{51.84\%}{100\%}\right)+ (mass 2)(\frac{48.16\%}{100\%})$$

$$107.87 amu=55.42 amu+\left(mass 2\right)\left(0.4816\right)$$

$$52.45 amu=\left(mass 2\right)(0.4816)$$

* 1. $amu=mass 2$
1. Explain the difference between a molecule and a formula unit. (Include information regarding the types of compounds that form each and why they do.)

Molecules are discrete particles, generally composed of non-metals, which are covalently bonded together. Formula units a unit of an ionic compound with balanced positive and negative charges. They are described as formula units because it is impossible to assign each ion to a specific unit or molecule? Formula units are composed of ions, generally a metal and a non-metal.

1. Describe the experiment performed by Goldstein and Crooks which first indicated the existence of electrons. What did they do and how did the experiment demonstrate the existence and nature of electrons?

Goldstein and Crooks ran and electrical current through an evacuated glass tube with a strip of metal painted with fluorescent paint. They observed a stream of particles flowing through the tube which was attracted to a positive charge and repelled by a negative charge. They concluded that the beam was composed of negatively charged particles they called electrons.

1. In what ways are isotopes of an element alike? In what ways are they different?

Isotopes of an element are alike because they must all have the same number of protons (and electrons for the neutral atom) or they would be different elements. Different isotopes of an element are different because they have different numbers of neutrons and thus different masses.

1. Complete the nomenclature table

Formula of Compound Type of Compound Name of Compound

(ionic, molecular, acid) (bonus for latin name, if

 appropriate)

|  |  |  |
| --- | --- | --- |
| FeS | Ionic | Iron(II) sulfide or ferrous sulfide |
| SiO2 | Molecular | Silicon dioxide |
| (NH4)2O | Ionic | Ammonium oxide |
| Al2(CO3)3 | Ionic | Aluminum carbonate |
| CoCl3 | Ionic | Cobalt(III) chloride or cobaltic chloride |
| Br3O8 | Molecular | Tribromine octoxide |
| HCl (aq) | Acid | Hydrochloric acid  |
| AgCN | Ionic | Silver cyanide |
| HNO2 (aq) | Acid | Nitrous acid |