**Unit 2 Review Sheet**

 I. Early models of the atom

 1. Dalton's Atomic Theory

 What were Dalton's 4 main points?

1. Matter is composed of small indivisible particles called atoms
2. An element is composed entirely of one type of atom
3. A compound contains atoms of two or more different elements
4. Atoms do not change their identities during a chemical reaction. They simply rearrange

 2. Who discovered the electron?

 J.J. Thomson

 What part of Dalton's Atomic Theory did this disprove?

 Atoms are indestructable

 3. What did the "Plum Pudding" model of the atom look like? Draw a

 picture

 4. How was Rutherford's model of the atom different from the "Plum

 Pudding" model?

 II. Isotopes

 -- An isotope contains the same number of protons but a different

 number of neutrons.

 Please refer to the handout given in class.

III. Average atomic mass

 Most elements have several different isotopes. The average mass for all of

 these isotopes therefore depends on the percentage of these isotopes as

 well as how much each individual isotope weighs.

 Practice problems:

 The element carbon exists as two isotopes. Those two isotopes are C-12

 (98.89%) and C-13 (1.11%). What is carbon's average atomic mass?

 12.0111

 The element sulfur exists as 4 different isotopes. Those isotopes are S-32

 (95.002%), S-33 (0.76%), S-34 (4.22%), and S-36 (0.014%). What is the

 average atomic mass for sulfur?

 32.09128

 The element zinc exists as 5 different isotopes. Their masses and

 abundances are listed in the table below. Calculate the average atomic

 mass of zinc.

 65.4595

|  |  |
| --- | --- |
| **Isotope** | **Abundance** |
| Zinc-64 | 48.89% |
| Zinc-66 | 27.81% |
| Zinc-67 | 4.11% |
| Zinc-68 | 18.57% |
| Zinc-70 | 0.62% |

 V. Ions

 1. Ions are formed by either gaining or losing \_electrons\_\_\_.

 2. A positive ion is called a \_cation\_\_, and a negative ion is called an

 \_\_anion\_\_\_.

VI. Radioactivity and Half-Life

 1. What are the five types of nuclear reactions (not counting fission and

 fusion)?

1. alpha

 b.) beta

1. gamma
2. Electron capture
3. Positron emision

 Refer to your textbook or WebAssign for practice on nuclear equations.

 2. What is meant by the term half-life?

 The time required for half of an original sample of radioactive isotope to decay

 3. Example half-life problems

 Nitrogen-13 has a half-life of 10 minutes. How many grams of this

 isotope will still be present at the end of three half lives if you begin

 with a mass of 28 g?

 3.5 g

 A patient is administered 20 mg of iodine-131. How much of this

 isotope will remain in the body after 40 days if the half-life for

 iodine-131 is 8 days?

 0.625 mg

 Radon-222 has a half-life of 3.8 days. How much of an initial 20.0 g

 sample of radon-222 would remain after 15.2 days?

 1.25 g