**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