

# Calculating Average Atomic Mass

Name \_\_\_\_\_

**Directions:** Solve each problem below. Refer to your chemistry journal for notes and examples. You may write your answers on a sheet of lined paper or you may print this sheet at your home and complete it. Your choice. Just remember that this assignment is due at the **START** of next class!

1. The term average atomic mass (amu) is a \_\_\_\_\_ average and is calculated differently as compared to “normal” average.

- A. weighted                      B. unique                      C. common                      D. bizarre

2. Calculate the average atomic mass of bromine. One bromine isotope has an atomic mass of 78.92 amu and a relative abundance of 50.69%. The other major bromine isotope has an atomic mass of 80.92 amu and a relative abundance of 49.31%.

3. The four isotopes of chromium are shown below, each with its percent by mass abundance and the composition of its nucleus. Using the following data, first calculate the approximate atomic mass of each isotope. Then calculate the average atomic mass of iodine.

	Isotope 1	Isotope 2	Isotope 3	Isotope 4
Protons	24	24	24	24
Neutrons	26	28	29	30
Atomic Mass (amu)				
Percentage	4.35%	83.79%	9.50%	2.37%

Average atomic mass of chromium = \_\_\_\_\_ amu

4. Hafnium is a good absorber of neutrons and is used in the control rods of nuclear reactors. Hafnium has 5 common isotopes:  $^{176}\text{Hf}$  (5%),  $^{177}\text{Hf}$  (19%),  $^{178}\text{Hf}$  (27%),  $^{179}\text{Hf}$  (14%), and  $^{180}\text{Hf}$  (35%). What is the average atomic mass of hafnium?
5. Uranium is used in nuclear reactors and is a rare element on earth. Uranium has three common isotopes. If the abundance of  $^{234}\text{U}$  is 0.01%, the abundance of  $^{235}\text{U}$  is 0.71%, and the abundance of  $^{238}\text{U}$  is 99.28%, what is the average atomic mass of uranium?

**BONUS:** Let's spice it up! Calculate the **relative abundance** of each isotope of iridium. The average atomic mass of iridium is 192.22amu. No, we did not do an example like this problem in our notes. If you get the answer correct, you will receive 5-bonus points added to your lowest lab or homework score.

Isotope	Atomic mass	Relative Abundance
Ir-191	191.0	
Ir-193	193.0	