chapter 4 avg atomic mass (Homework)

1.
Explain how the existence of isotopes is related to atomic masses not being whole numbers.

2.
Nitrogen has two naturally occurring isotopes, N-14 and N-15. The atomic mass of nitrogen is 14.007 amu. Which isotope is more abundant in nature?
Explain.

3.
Define the atomic mass unit. (4.3)
amu =

What were the benefits of developing the atomic mass unit as a standard unit of mass?

4.
Chlorine, which has an atomic mass of 35.453 amu, has two naturally occurring isotopes, Cl-35 and Cl-37. Which isotope occurs in greater abundance?
Explain.

5.
Silver has two isotopes, $^{107}_{47}$Ag has a mass of 106.905 amu (52.00%), and $^{109}_{47}$Ag has a mass of 108.905 amu (48.00%). What is the atomic mass of silver?

6.
Boron-10 and boron-11 are the naturally occurring isotopes of elemental boron. If boron has an atomic mass of 10.81 amu, which isotope occurs in greater abundance?

7.
Calculate the atomic mass of titanium. The five titanium isotopes have atomic masses and relative abundances of 45.953 amu (8.00%), 46.952 amu (7.30%), 47.948 amu (73.80%), 48.948 amu (5.50%), and 49.945 amu (5.40%).

8.
An element has three naturally occurring isotopes. What other information must you know in order to calculate the element's atomic mass?

9.

Copper has two naturally occurring isotopes and an atomic mass of 63.546 amu. Cu-63 has a mass of 62.940 amu and an abundance of 69.17%. What is the identity and percent abundance of copper's other isotope? (Type your answer for identity using the format Cl-35 for chlorine-35.)
identity

percent abundance

10.

| Characteristics of Naturally Occurring Neon Isotopes | | | |
Isotope	Atomic number	Mass (amu)	Percent abundance
20Ne	10	19.992	90.48
21Ne	10	20.994	0.27
22Ne	10	21.991	9.25

Based on the table, an atom of neon found in nature would most likely have a mass of

11.
The volume of an atom is made up mostly of