

Isotopes Worksheet

It is important that you remember that the atomic mass of an element is a weighted average mass of the atoms in a naturally occurring sample of an element. Because atomic masses in the periodic table reflect both the masses and relative natural abundance of isotopes you must know the following:

1. the number of stable isotopes of the element.
2. the mass of each isotope.
3. the natural percent abundance of each isotope.

EXAMPLES

Oxygen has three isotopes O-16, O-17, and O-18 with masses 15.995 amu, 16.995 amu, and 17.999 amu, respectively; and a natural percent abundance of 99.795, 0.037, and .204, respectively. Calculate the atomic mass for oxygen.

Carbon has an average atomic mass of 12.011 amu. Given that there are two isotopes of Carbon, C-12 (mass=12.000 amu) and C-13 (mass=13.003 amu), calculate the natural percent abundance for each isotope.

Chapter 4 Handout 4.A *In-Class Worksheet.* *Calculating the atomic mass from the Relative Abundance of Isotopes.*

1. Boron has two naturally occurring isotopes with masses of 10.0129 amu which occupies 19.91 percent and another isotope of 11.0093 amu and occupying 80.09 percent. Calculate the average atomic mass of Boron (The number listed on the periodic table)
2. Bromine has two isotopes with the first having a mass of 78.918336 amu and occupying 50.69% and the second isotope having a mass of 80.916289 amu and occupying 49.31%. What is the average atomic mass of bromine?
3. Verify the atomic mass of Chlorine as 35.45 amu knowing that chlorine has two isotopes of the following data:
 ^{35}Cl = 34.96885 amu and percent abundance of 75.77%
 ^{37}Cl = 36.96590 amu and percent abundance of 24.23%
4. Verify the atomic mass of Magnesium as 24.31 amu knowing the following information:
 ^{24}Mg = 23.985042 amu and percent abundance of 78.99%
 ^{25}Mg = 24.985837 amu and percent abundance of 10.00%
 ^{26}Mg = 25.982593 amu and percent abundance of 11.01%