

Pre-AP Chemistry/Chemistry/AP Chemistry
Unit #4—Periodicity

Percent Abundance

Boron has two naturally occurring isotopes, Boron-10 and Boron-11. Boron-10 has a mass of 10.013 amu and abundance of 19.8% while Boron-11 has a mass of 11.009 amu and abundance of 80.2%. Calculate the atomic mass of boron.

$$\text{Boron-10} = \frac{80.2}{100} = 0.802$$

$$\text{Boron-11} = \frac{19.8}{100} = 0.198$$

$$\begin{array}{rclcl} \text{Boron-10} & = & (10.013 \text{ amu}) & (0.802) & = & 8.030 \text{ amu} \\ \text{Boron-11} & = & (11.009 \text{ amu}) & (0.198) & = & \frac{2.180 \text{ amu}}{10.210 \text{ amu}} \end{array}$$

The element copper has naturally occurring isotopes with mass numbers of 63 and 65. The relative abundance and atomic masses are 69.2% for mass = 62.93 amu and 30.8% for mass = 64.93 amu. Calculate the average atomic mass of copper.

$$\text{Copper-63} = \frac{69.2}{100} = 0.692$$

$$\text{Copper-65} = \frac{30.8}{100} = 0.308$$

$$\begin{array}{rclcl} \text{Copper-63} & = & (62.930 \text{ amu}) & (0.692) & = & 43.548 \text{ amu} \\ \text{Copper-65} & = & (64.930 \text{ amu}) & (0.308) & = & \frac{19.998 \text{ amu}}{63.546 \text{ amu}} \end{array}$$