

Chemistry – Chapter 4 Book assignment #2: Isotopes, average atomic mass calculations

1. Boron has two isotopes: boron-10 and boron-11. Which is more abundant, given that the atomic mass of boron is 10.81 amu?
2. There are three isotopes of silicon; they have mass numbers of 28, 29, and 30. The atomic mass of silicon is 28.086 amu. Comment on the relative abundance of these three isotopes.
3. 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 atomic mass of copper.
4. Calculate the atomic mass of bromine. The two isotopes of bromine have atomic masses and relative abundance of 78.92 amu (50.69%) and 80.92 amu (49.31%).
5. What distinguishes the atoms of one element from the atoms of another?
6. How do the isotopes of a given element differ from one another?
7. How is atomic mass calculated?
8. What equation tells you how to calculate the number of neutrons in an atom?
9. How is atomic number different from mass number?
10. What does the number represent in the isotope platinum-194?
11. The atomic masses of elements are generally not whole numbers. Explain why/how this can be.
12. Which of argon's three isotopes is most abundant: argon-36, argon-38, or argon-40? The atomic mass of argon is 39.948 amu.
13. List the number of protons, neutrons, and electrons in each pair of isotopes:
 - a. ${}^6\text{Li}^3$, ${}^7\text{Li}^3$
 - b. ${}^{42}\text{Ca}^{20}$, ${}^{44}\text{Ca}^{20}$
 - c. ${}^{78}\text{Se}^{34}$, ${}^{80}\text{Se}^{34}$