

Che 111: Chapter 9 Practice Problems

1. The unit most often used to describe the mass of atoms is the atomic mass unit, whose symbol is u or amu. An atomic mass unit is defined as exactly_____ the mass of an atom of carbon-12.
2. One _____ of carbon contains 6.022×10^{23} carbon atoms
3. What is the weighted average mass in grams of 6.022×10^{23} atoms of the elements (a) bromine and (b) nickel?
4. A multivitamin tablet contains 40 milligrams of potassium. How many moles of potassium does each tablet contain?
5. For each of the following ionic substances (a) Co_2O_3 and (b) $\text{Fe}_2(\text{C}_2\text{O}_4)_3$, calculate its formula mass and write a conversion factor that converts between mass in grams and moles of the substance.

6. A multivitamin tablet contains 5 μg of nickel in the form of nickel(II) sulfate (NiSO_4). How many micrograms of NiSO_4 does each tablet contain?

7. A sample of an ionic compound that is used in the semiconductor industry is analyzed and found to contain 53.625 g of indium and 89.375 g of tellurium. What is the empirical formula for this compound?

8. Hydralazine is a drug used to treat heart disease. It is 59.99% carbon, 5.03% hydrogen, and 34.98% nitrogen and has a molecular mass of 160.178. What is the molecular formula for hydralazine?

9. Spodumene is a lithium aluminum silicate containing the equivalent of 6.5 % to 7.5 % lithium oxide, Li_2O . Crude ore mined in North Carolina contains 15 % to 20 % spodumene. What maximum mass, in kilograms, of lithium could be formed from 2.538 megagrams of spodumene containing the equivalent of 7.0 % Li_2O ?