Exercise 3.3e

Two-Step Mole Conversions

Name: _____

Date: _____ Per: _____

Because *1 mole = 6.022 x 10^{23}* and *1 mole = the atomic mass of an element in grams*, the mole may be used to convert between the number of atoms in a sample and its mass.

Two Step: Particle → Mass Conversions

$$\text{\_ p. X} \left| \frac{\text{1 mol X}}{\text{6.022 x } 10^{23} \text{ p. X}} \right| \frac{\text{molar mass X}}{\text{1 mol X}} = \text{\_\_\_\_ g X}$$

DIRECTIONS: Calculate the mass of:

1. 3.45 x 10^{24} atoms carbon

2. 9.17 x 10^{23} atoms nickel

3. 1.45 x 10^{22} atoms silver

Because *1 mole = the atomic mass of an element in grams and, 1 mole = 6.022 x 10^{23}* the mole may be used to convert between mass and the number of atoms in a sample.

Two Step: Mass → Particle Conversions

$$\text{\_ g X} \left| \frac{\text{1 mol X}}{\text{molar mass X}} \right| \frac{\text{6.022 x } 10^{23} \text{ p. X}}{\text{1 mol X}} = \text{\_\_\_\_ p. X}$$

DIRECTIONS: Calculate the number of atoms in:

4. 178 g gold

5. 125 g phosphorus

6. 15.2 g fluorine

Answers: 1) 68.8 g 2) 89.4 g 3) 2.60 g 4) 5.44 x10^{23} p. 5) 2.43 x10^{24} p. 6) 4.82 x10^{23} p.