Mole Conversions Worksheet #1

1. Mole –> Mass Conversions – using molar mass of each substance, convert the following quantities.

   a. 10.0 mol Cr 520 g
   b. 3.32 mol K 130 g
   c. 2.20 x 10^{-3} mol Sn 0.261 g
   d. 0.720 mol Be 6.48 g
   e. 2.40 mol N_2 67.2 g
   f. 0.160 mol H_2O 2.88 g
   g. 5.08 mol $Ca(NO_3)_2$ 834 g
   h. 15.0 mol H_2SO_4 1470 g
   i. 4.52 x 10^{-5} mol C_2H_4 1.27 x 10^{-3} g
   j. 0.0112 mol K_2CO_3 1.55 g

2. Mass –> Mole Conversions – using molar mass of each substance convert the following quantities.

   a. 72.0 g Ar 1.80 mol
   b. 3.70 x 10^{-1} g B 3.43 x 10^{-2} mol
   c. 187 g Al 6.93 mol
   d. 333 g SnF_2 2.13 mol
   e. 7.21 x 10^{-2} g He 1.80 x 10^{-2}
   f. 27.4 g NO_2 0.596 mol
   g. 5.00 g H_2 2.50 mol
   h. 2.64 x 10^{-4} g Li_3PO_4 2.28 x 10^{-6} mol
   i. 11.0 g CH_4 0.688 mol
   j. 847 g $(NH_4)_2CO_3$ 8.82 mol

3. What is the volume of the following gases?

   a. 5.40 mol O_2 121 L
   b. 3.20 x 10^{-2} mol CO_2 0.717 L
   c. 0.960 mol SO_3 21.5 L

4. How many moles are in each of the following volumes?

   a. 89.6 L Ne 4.00 mol
   b. 1.00 x 10^{3} L C_2H_6 44.6 mol
   c. 5.42 x 10^{-1} F_2 2.42 x 10^{-2} mol

5. Find the number of moles in each of the number of representative particles.

   a. 1.20 x 10^{25} atoms of P 19.9 mol
   b. 3.87 x 10^{21} molecules of AlF_3 6.43 x 10^{-3} mol
   c. 4.81 x 10^{14} molecules of NH_3 7.99 x 10^{-10} mol

6. How many representative particles are in each of the following mole quantities?

   a. 1.24 mol Cl_2 7.46 x 10^{23} molecules
   b. 4.20 x 10^{-3} mol K_2S 2.53 x 10^{21} molecules
   c. 34.02 mol $Ca(OH)_2$ 2.048 x 10^{25} molecules

7. Convert the following two-step quantities, converting first to moles and then to the desired quantity.

   a. Find the number of molecules in 60.0 g of N_2O. 8.21 x 10^{23} molecules
   b. Find the volume of 3.24 x 10^{22} molecules of Ne 1.21 L
   c. Find the mass of 18.0 L of CH_4 12.9 g
   d. Find the volume of 835 g of SO_3 234 L
   e. Find the mass of one atom of nickel. 1 x 10^{-22} g

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   h. 15.0 mol H_2SO_4
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   j. 847 g $(NH_4)_2CO_3$

3. What is the volume of the following gases? (1 mol at STP = 22.4 L)

   a. 5.40 mol O_2
   b. 3.20×10^{-2} mol CO_2
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