

**WKS**  
**Mole Conversions**

Name Answer Key  
Period \_\_\_\_\_

**PART I:** Find the Molar Masses (MM) for the following substances. (*Look up the mass of each element on the periodic table and add them all up.*) Write all molar masses with at least 4 sig figs.

- a) MM of Al = 26.98 g/mol  
b) MM of  $\text{PCl}_3$  =  $30.97 + 3(35.45) = 137.3$  g/mol  
c) MM of  $\text{Na}_2\text{SO}_4$  =  $2(22.99) + 32.06 + 4(16.00) = 142.1$  g/mol  
d) MM of  $\text{Mg}(\text{NO}_3)_2$  =  $24.31 + 2(14.01) + 6(16.00) = 148.3$  g/mol

**For the Rest of the WKS:** Use the dimensional analysis/factor label method. Every number must have units. Write answers with correct number of sig figs.

**PART II: Conversions between grams and moles.** (*All molar mass values must have at least 4 sig figs.*)

Use: grams  $\xleftarrow{\text{Molar Mass (? g/mol)}}$  moles

- 1) 45.0 g of Ca = ? moles of Ca

$$? \text{ mol Ca} = 45.0 \text{ g Ca} \times \frac{1 \text{ mol Ca}}{40.08 \text{ g Ca}} = \boxed{1.12 \text{ mol Ca}}$$

- 2) 0.0190 moles MgO = ? grams of MgO

$$\text{MM MgO} = 24.31 + 16.00 = 40.31 \text{ g/mol}$$

$$? \text{ g MgO} = 0.0190 \text{ mol MgO} \times \frac{40.31 \text{ g MgO}}{1 \text{ mol MgO}} = \boxed{0.766 \text{ g MgO}}$$

- 3) 7.32 g of  $\text{Ba}(\text{OH})_2$  = ? moles of  $\text{Ba}(\text{OH})_2$

$$\text{MM Ba}(\text{OH})_2 = 137.33 + 2(16.00) + 2(1.008) = 171.35 \text{ g/mol}$$

$$? \text{ mo Ba}(\text{OH})_2 = 7.32 \text{ g Ba}(\text{OH})_2 \times \frac{1 \text{ mol Ba}(\text{OH})_2}{171.35 \text{ g Ba}(\text{OH})_2} = \boxed{0.0427 \text{ mol Ba}(\text{OH})_2}$$

**PART III: Conversions between moles and atoms or molecules**

**REMEMBER:** moles  $\xleftarrow{\text{Avogadro's \#}}$  atoms or molecules  
( $6.022 \times 10^{23}$  atoms or mlcls/mol)

- 4)  $4.87 \times 10^{23}$  atoms of H = ? moles of H

$$? \text{ mol H} = 4.87 \times 10^{23} \text{ atoms H} \times \frac{1 \text{ mol H}}{6.022 \times 10^{23} \text{ atoms H}} = \boxed{0.810 \text{ mol H}}$$

- 5) 0.56 moles of  $\text{PCl}_5$  = ? molecules of  $\text{PCl}_5$

$$? \text{ mlcl PCl}_5 = 0.56 \text{ mol PCl}_5 \times \frac{6.022 \times 10^{23} \text{ mlcl PCl}_5}{1 \text{ mol PCl}_5} = \boxed{3.4 \times 10^{23} \text{ mlcl PCl}_5}$$