

## Mole Conversions:

*Avogadro's number and Molar Mass*

*Practice Sheet # 17*

1. Define Molar Mass.
2. What are the units for molar mass?
3. Using the periodic table, determine the molar masses of these substances. Show all the steps of calculations.
  - a. Helium
  - b. Fluorine
  - c.  $\text{SiO}_2$
  - d.  $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$
  - e.  $\text{Ca}(\text{NO}_3)_2$
  - f. Hydrochloric acid
4. **Conversions:** Show all conversion steps for full credit. Use your answers for the calculation of molar mass from above.
  - a. What is the mass of 2.0 moles of  $\text{SiO}_2$ ?
  - b. How many moles is 100.0 g of  $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$  ?

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- c. How many moles is in 75 g of  $\text{Ca}(\text{NO}_3)_2$ ?
  
- d. There are  $7 \times 10^9$  people on earth right now. How many moles of people is this?
  
5. Caffeine is the stimulant that is found in beverages such as coffee, tea, and Coca-Cola™. The chemical formula of caffeine is  $\text{C}_8\text{H}_{10}\text{N}_4\text{O}_2$ , what is the molar mass?
  
6. (10) An ore is a type of rock that contains minerals with important elements including metals. Ores are mined and the important elements are extracted. The metal vanadium is found in the mineral Vanadinite. Vanadinite has the chemical formula  $\text{Pb}_5(\text{VO}_4)_3\text{Cl}$ . Vanadinite is a dense, brittle mineral with red crystals. Determine the molar mass of this substance.
  
7. What is Avogadro's number?
  
8. How many moles are in  $8.23 \times 10^{23}$  molecules of hydrogen?
  
9. How many atoms of carbon would be in 5.30 moles of carbon?
  
10. How many molecules of hydrogen are in 0.0075 moles of hydrogen?