

# Stoichiometry – Calculating Quantities in Chemical Reactions

**Example: Moles <--> Moles conversion.**

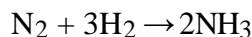
- 1) Aluminum reacts with bromine to form aluminum bromide (used as an acid catalyst in organic synthesis).



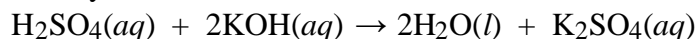
How many moles of Al are needed to form 2.43 mol of  $\text{Al}_2\text{Br}_6$ ?

**Practice/Exploration:** Check if you're already in moles, if not, a) find a way to convert to moles, then b) convert to moles of the other substance in the reaction using coefficients from the chemical equations, then c) convert to the information/unit requested for your answer.

- 2) **Mass Stoichiometry**- What mass of nitrogen gas is required to react completely with 2.79 g of hydrogen gas to produce ammonia? 2) \_\_\_\_\_



- 3) **Solution Stoichiometry**- What volume (in Liters) of 0.200 M  $\text{H}_2\text{SO}_4$  solution is required to react exactly with 0.050 L of 0.100 M KOH? 3) \_\_\_\_\_



- 4) **Gas Stoichiometry**- What volume of  $\text{CO}_2$  gas at STP could be produced by the decomposition of 45.0 g of  $\text{CaCO}_3$ ? 4) \_\_\_\_\_



- 5) **Energy Stoichiometry**- Given that  $\text{CaO}(s) + \text{H}_2\text{O}(l) \rightarrow \text{Ca}(\text{OH})_2(s)$ , heat of reaction =  $-64.8 \text{ kJ/mol}$ , how many grams of CaO must react in order to liberate 525 kJ of heat? 5) \_\_\_\_\_

## Answer Key

Testname: CH 11- STOICHIOMETRY

- 1) 4.86 mol
- 2) 12.9 g
- 3) 0.0125 L
- 4) 10.1 L
- 5) 454 g