

GAS STOICHIOMETRY

- 1) What mass of sulfur must be used to produce 12.61 L of SO₂ at STP?



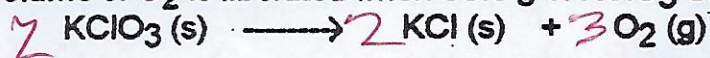
$$12.61 \text{ L} \times \frac{\text{mole}}{22.414 \text{ L}} \times \frac{1 \text{ S}}{1 \text{ SO}_2} \times \frac{32.06 \text{ g}}{\text{mole}} = 18.0 \text{ g S}$$

- 2) How many liters of CO can be produced from 65.5 g of C at STP?



$$65.5 \text{ g C} \times \frac{\text{mole}}{12.01 \text{ g}} \times \frac{2 \text{ CO}}{2 \text{ C}} \times \frac{22.414 \text{ L}}{\text{mole}} = 122 \text{ L CO}$$

- 3) What volume of O₂ is liberated when 30.6 g of KClO₃ decomposes at STP?



$$30.6 \text{ g KClO}_3 \times \frac{\text{mole}}{122.55 \text{ g}} \times \frac{3 \text{ O}_2}{2 \text{ KClO}_3} \times \frac{22.414 \text{ L}}{\text{mole}} = 8.40 \text{ L O}_2$$



- 4) How many liters of H₂ at STP can be produced from 4.60 g of Na?

$$4.60 \text{ g Na} \times \frac{\text{mole}}{22.99 \text{ g}} \times \frac{1 \text{ H}_2}{2 \text{ Na}} \times \frac{22.414 \text{ L}}{\text{mole}} = 2.24 \text{ L H}_2$$

- 5) How many grams of Na are needed to react with water to form 400 ml of hydrogen gas at STP?

$$0.400 \text{ L H}_2 \times \frac{\text{mole}}{22.414 \text{ L}} \times \frac{2 \text{ Na}}{1 \text{ H}_2} \times \frac{22.99 \text{ g}}{\text{mole}} = 0.82 \text{ g Na}$$