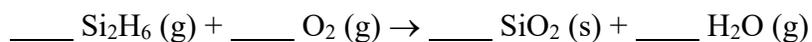


WKS – Extra
Stoichiometry Review

NAME _____
Period _____ **Date** _____

- 1) Disilane (Si_2H_6) is a highly flammable gas ($D = 2.70 \text{ g/L @ } 25^\circ\text{C}$) that reacts with oxygen gas to form solid silicon dioxide (SiO_2) and water vapor:



- a. Balance the equation with the lowest whole number coefficients.
- b. How many moles of oxygen would be used to completely react with 12.5 moles of disilane?

- c. How many liters of disilane, at 25°C , would be needed to react with sufficient oxygen to produce 50.0 g of silicon dioxide?

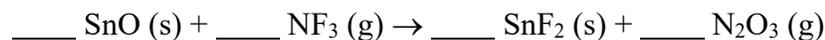
- d. When 27.1 L disilane @ STP (NOT 25°C) reacts with 70.1 L O_2 , also at STP, which reactant is limiting?

- e. How many L of the excess reactant remain after the reaction is complete?

- f. What is the theoretical yield of *solid* silicon dioxide from these reactants?

- g. After the reaction, you find that you have collected 97.8 g silicon dioxide. What is the percent yield?

- 2) When solid tin(II) oxide (SnO) reacts with nitrogen trifluoride gas (NF₃), solid tin(II) fluoride (SnF₂) and gaseous dinitrogen trioxide (N₂O₃) are produced.



- Balance the equation with the lowest whole number coefficients.
- How many moles of tin(II) oxide would be needed to form 29.4 L of N₂O₃ at STP?
- How many grams of tin(II) oxide would be needed to completely react with 44.1 L of nitrogen trifluoride (D = 2.90 g/L)?
- When 158.9 g tin(II) oxide reacts with 62.5 g nitrogen trifluoride, which reactant is limiting?
- How many grams of the excess reactant remain after the reaction is complete?
- What is the theoretical yield of dinitrogen trioxide from these reactants?
- After the reaction, you isolate 24.8 g dinitrogen trioxide. What is the percent yield?

Answers: 1a) 2,7,4,6; 1b) 43.8 mol O₂; 1c) 9.59 L Si₂H₆; 1d) O₂ is limiting; 1e) 7.1 L Si₂H₆ remaining; 1f) 107 g SiO₂; 1g) 91.4%; 2a) 3.23, 1; 2b) 3.94 mol SnO; 2c) 364 g SnO; 2d) SnO is limiting; 2e) 6.6 g NF₃ remaining; 2f) 29.90 g N₂O₃; 2g) 82.9%