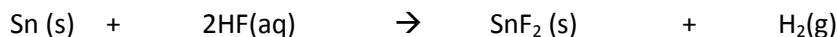


## Stoichiometry Worksheet 2

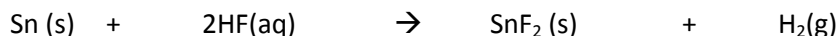
1. Tin (II) Fluoride, formerly found in many toothpastes, is formed in this reaction



- How many grams of  $\text{SnF}_2$  can be made by reacting  $7.42 \times 10^{24}$  molecules of HF with tin? (965 g)
  - How many liters of hydrogen gas at STP are produced by reacting 23.4 grams of Sn with HF? (4.42 g)
  - How many liters of HF are needed to produce 14.2 L of  $\text{H}_2$  at STP? (28.4 L)
  - How many molecules of  $\text{H}_2$  are produced by the reaction of tin with 80.0 L of HF at STP?  
( $1.08 \times 10^{24}$  molecules)
2. Hydrazine,  $\text{N}_2\text{H}_4$ , is used in rocket fuel. It reacts with oxygen to form nitrogen and water vapor.
- How many liters of nitrogen at STP form when 100.0 grams of hydrazine reacts with enough oxygen to use up all of the hydrazine? (70.00 L)
  - How many molecules of  $\text{N}_2\text{H}_4$  are needed to produce 17.8 liters of  $\text{N}_2$  at STP? ( $4.79 \times 10^{23}$  molecules)
3. Hydrosulfuric acid ( $\text{H}_2\text{S}$ ) reacts with nitric acid ( $\text{HNO}_3$ ) to form nitrogen monoxide, water and sulfur.
- How many grams of each reactant are needed to form 18.2 grams of sulfur? (19.3 g and 23.8g)
  - How many grams of water are produced when 43.7 grams of  $\text{H}_2\text{S}$  reacts with excess nitric acid? (30.8 g)
  - How many atoms of sulfur form when 5.86 grams of nitric acid reacts with excess hydrosulfuric acid?  
( $8.42 \times 10^{22}$  atoms)
4. Ethyl alcohol,  $\text{C}_2\text{H}_5\text{OH}$ , can be produced by the fermentation of glucose. If it takes 5.0 hours to produce 8.0 kg of alcohol, how many days will it take to consume  $1.0 \times 10^3$  kg of glucose?  $\text{C}_6\text{H}_{12}\text{O}_6 \rightarrow \text{C}_2\text{H}_5\text{OH} + \text{CO}_2$  (13.3 days)
5. A car get 9.2 kilometers to a liter of gasoline. Assuming that gasoline is 100% octane,  $\text{C}_8\text{H}_{18}$ , and has a density of .69 g/L, how many liters of air (21% oxygen by volume at STP) will be required to burn the gasoline for a 1250. kilometer trip? Assume complete combustion. ( $1.1 \times 10^3$  L)

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