

WORKSHEET 16

Chemistry 110

Name _____
(last) (first)

Due date: _____

Solve the following problems, giving complete set-ups, including all units, and using correct significant figures. If work is not shown, NO CREDIT will be given for the correct answer.

1. Answer the following questions with respect to the equation: $2 \text{H}_2\text{S}(\text{g}) + 3 \text{O}_2(\text{g}) \rightarrow 2 \text{SO}_2(\text{g}) + 2 \text{H}_2\text{O}(\text{g})$

[Molar masses: $\text{H}_2\text{S} = 34.08$ $\text{O}_2 = 32.00$ $\text{SO}_2 = 64.06$ $\text{H}_2\text{O} = 18.02$]

a. What volume, in mL, of sulfur dioxide can be made from 13 L of oxygen and 9.0 L of hydrogen sulfide gas at STP? 1a. _____

b. How many grams of hydrogen sulfide must react to produce 6.0 L of water at 1.25 atm and 23°C? 1b. _____

c. How many liters of sulfur dioxide at 244 torr and 35°C are produced from 2.3 g of oxygen? 1c. _____

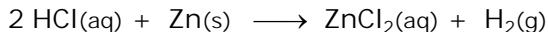
2. How many liters of ammonia, measured at STP, is needed to produce 2.65 grams of calcium nitride? $6 \text{Ca}(\text{s}) + 2 \text{NH}_3(\text{g}) \rightarrow 3 \text{CaH}_2(\text{s}) + \text{Ca}_3\text{N}_2(\text{s})$ 2. _____

[Molar masses: $\text{Ca} = 40.08$ $\text{NH}_3 = 17.03$ $\text{CaH}_2 = 42.09$ $\text{Ca}_3\text{N}_2 = 148.25$]

3. What volume, in L, of oxygen, measured at 29° C and 772 mm Hg, is required to completely react 3.26 grams of sodium? $4 \text{Na}(\text{s}) + \text{O}_2(\text{g}) \rightarrow 2 \text{Na}_2\text{O}(\text{s})$ 3. _____

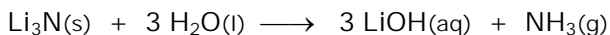
[Molar masses: $\text{Na} = 22.99$ $\text{O}_2 = 32.00$ $\text{Na}_2\text{O} = 61.98$]

4. How many milliliters of 1.33 M hydrochloric acid solution are required to produce 10.44 liters of hydrogen at 1.33 atm and 35°C. 4. _____



[Molar masses: HCl = 36.46 Zn = 65.39 ZnCl₂ = 136.30 H₂ = 2.02]

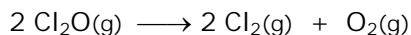
5. Lithium nitride reacts with water according to the equation: 5. _____



[Molar masses: Li₃N = 34.83 3H₂O = 18.02 LiOH = 23.95 NH₃ = 17.03]

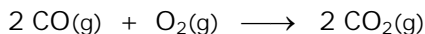
In the reaction 100.0 mL of ammonia at STP are produced, and there is 255 mL of solution containing LiOH. What is the molar concentration of the LiOH solution?

6. How many liters of oxygen, measured at 596 torr and 27°C, are produced by the decomposition of 955 milliliters of Cl₂O at 0.833 atm and 27°C? 6. _____



[Molar masses: Cl₂O = 86.90 Cl₂ = 70.91 O₂ = 32.00]

7. 5.0 mole CO and 11.0 mole oxygen react in a 10 liter container.



[Molar masses: CO = 28.01 O₂ = 32.00 CO₂ = 44.01]

- a. How many moles of CO, O₂ and CO₂ are present at the end of the reaction, and what are the total moles??

7a. _____
(mole CO)

(mole O₂)

(mole CO₂)

(total moles)

- b. What will be the total pressure, in atm, in the flask at 273 K? 7b. _____