Chemistry

Name _____

Period _____ Date _____

Chemical Reactions

STOICHIOMETRY WORKSHEET A

1. Nitrogen gas reacts with hydrogen gas, forming ammonia gas.

(a) Write the balanced equation for the reaction.

(b) Find the molar masses of the substances in the reaction.

N_2: H_2: NH_3:

(c) Find the moles of NH_3 (g) formed when 5.00 moles of H_2 (g) reacts.

GIVEN: 5.0 mol H_2

DESIRED: ? mol NH_3

WORK:

ANSWER:

(d) Find the moles of H_2 (g) required when 3.5 grams of N_2 (g) reacts.

GIVEN:

DESIRED:

WORK:

ANSWER:

(e) Find the grams of H_2 (g) needed to form 21.1 moles of NH_3 (g).

GIVEN:

DESIRED:

WORK:

ANSWER:

(f) Find the moles of NH_3 (g) produced at STP when 9.62 grams of N_2 (g) is used.

GIVEN:

DESIRED:

WORK:

ANSWER:

2. Solid potassium chlorate decomposes to form solid potassium chloride and oxygen gas.

(a) Write the balanced equation for the reaction.

(b) Find the molar masses of the substances in the reaction.

$KClO_3$: KCl: O_2:

(c) Find the mass of KCl (s) produced when 42.0 moles of $KClO_3$ (s) decomposes.

GIVEN:

DESIRED:

WORK:

ANSWER:

(d) Find the moles of O_2 (g) produced at STP when 42.0 grams of $KClO_3$ (s) decomposes.

GIVEN: | WORK: | ANSWER:

DESIRED:

3. Zinc metal is placed in a solution of hydrochloric acid to form hydrogen gas and aqueous zinc chloride.

(a) Write the balanced equation for the reaction.

(b) Find the mass of Zn (s) required to produce 12.6 L of H_2 (g) at STP.

GIVEN: | WORK: | ANSWER:

DESIRED:

(c) Calculate the moles of HCl (aq) required to produce 12.6 grams of H_2 (g) a STP.

GIVEN: | WORK: | ANSWER:

DESIRED:

(d) Find the moles of HCl (aq) used if 20 moles of zinc is available to react.

GIVEN:: | WORK: | ANSWER:

DESIRED:

4. A solution of lead (II) acetate is combined with a solution of hydrochloric acid forming a lead(II) chloride precipitate and acetic acid.

(a) Write the balanced equation for the reaction.

(b) Find the molar masses of the substances in the reaction.

$Pb(C_2H_3O_2)_2$: | HCl: | $PbCl_2$ | $HC_2H_3O_2$:

(c) Find the mass of lead(II) acetate required to react to form 25 moles of lead (II)chloride.

GIVEN: | WORK: | ANSWER:

DESIRED:

(d) Calculate the moles of acetic acid produced when 94.5 g of lead (II) chloride is formed.

GIVEN: | WORK: | ANSWER:

DESIRED:

5. Nitrogen monoxide gas reacts with oxygen gas to produce nitrogen dioxide gas.

(a) Write the balanced equation for the reaction.

(b) Find the molar masses of the substances in the reaction.

NO: O_2: NO_2:

(c) Find the moles of NO_2 (g) formed when 5.00 moles of O_2 (g) reacts.

GIVEN: WORK: ANSWER:

DESIRED:

(d) Find the moles of NO (g) required when 3.5 grams of O_2 (g) reacts.

GIVEN: WORK: ANSWER:

DESIRED:

(e) Find the grams of O_2 (g) needed to form 24.1 grams of NO_2 (g).

GIVEN: WORK: ANSWER:

DESIRED:

(f) Find the grams of NO_2 (g) produced at STP when 9.6g of NO (g) is used.

GIVEN: WORK: ANSWER:

DESIRED:

6. Solid aluminum reacts with chlorine gas to produce solid aluminum chloride.

(a) Write the balanced equation for the reaction.

(b) Find the molar masses of the substances in the reaction.

Al: Cl_2: $AlCl_3$:

(c) Find the mass of Al (s) produced when 4.2 moles ofCl_2 (g) reacts.

GIVEN: WORK: ANSWER:

DESIRED:

(d) How many moles of Cl_2 (g) must react to produce 12.3g of $AlCl_3$?

GIVEN: WORK: ANSWER:

DESIRED:

7. Solid calcium reacts with oxygen gas to produce solid calcium oxide.

(a) Write the balanced equation for the reaction.

(b) Find the mass of Ca (s) required to produce 10.5 moles of CaO (s).

GIVEN:	WORK:	ANSWER:
DESIRED:		

(c) Calculate the moles of O_2 (g) required to produce 27.8 grams of CaO (s).

GIVEN:	WORK:	ANSWER:
DESIRED:		

(d) How many grams of O_2 (g) are required to form 3.5 moles of CaO (s)?

GIVEN:	WORK:	ANSWER:
DESIRED:		

8. Ammonia gas reacts with oxygen gas to produce nitrogen monoxide and water.

(a) Write the balanced equation for the reaction.

(b) Find the molar masses of the substances in the reaction.

NH_3:	O_2:	NO	H_2O:

(c) How many moles of NO are formed if 824g of NH_3 react?.

GIVEN:	WORK:	ANSWER:
DESIRED:		

(d) How many moles of oxygen are needed to react with 4.6 moles of ammonia.

GIVEN:	WORK:	ANSWER:
DESIRED:		