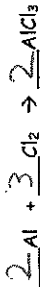


# 2) Mole - mass

Worksheet: Mole/Mass Problems  
Name: \_\_\_\_\_  
KEY:

Answer each of the following questions using the equation provided. BE SURE TO BALANCE EACH EQUATION BEFORE SOLVING ANY PROBLEMS. SHOW ALL WORK.

1. In a reaction between the elements aluminum and chlorine, aluminum chloride is produced.



a. 2 moles of Al will react with \_\_\_\_\_ mole(s) of Cl<sub>2</sub> to produce \_\_\_\_\_ mole(s) of AlCl<sub>3</sub>.

2 mol Al	1 mol AlCl <sub>3</sub>	2 mol AlCl <sub>3</sub>
1 mol Al		

b. How many grams of AlCl<sub>3</sub> will be produced if 2.50 moles of Al react?

2.50 mol Al	1 mol AlCl <sub>3</sub>	133.35 g AlCl <sub>3</sub>	333.375 g AlCl <sub>3</sub>
1 mol Al	1 mol AlCl <sub>3</sub>		

c. How many moles of Cl<sub>2</sub> must react to produce 12.3 g of AlCl<sub>3</sub>?

12.3 g AlCl <sub>3</sub>	1 mol AlCl <sub>3</sub>	1 mol Cl <sub>2</sub>	0.092 mol Cl <sub>2</sub>
133.35 g AlCl <sub>3</sub>	1 mol AlCl <sub>3</sub>		

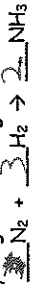
d. How many grams of aluminum will react with 3.4 moles of chlorine?

3.4 mol Cl <sub>2</sub>	2 mol Al	27 g Al	61.2 g Al
3 mol Cl <sub>2</sub>	1 mol Al		

e. If 17 grams of aluminum react, how many moles of aluminum chloride will be produced?

17 g Al	1 mol Al	1 mol AlCl <sub>3</sub>	133.2 g AlCl <sub>3</sub>
27 g Al	1 mol Al	1 mol AlCl <sub>3</sub>	83.81 g AlCl <sub>3</sub>

2. The ammonia (NH<sub>3</sub>) used to make fertilizers for lawns and gardens is made by reacting nitrogen and hydrogen according to the following reaction.



a. Determine the mass in grams of NH<sub>3</sub> formed from 1.34 moles of nitrogen.

1.34 mol N <sub>2</sub>	2 mol NH <sub>3</sub>	17 g NH <sub>3</sub>	45.56 g NH <sub>3</sub>
1 mol N <sub>2</sub>	1 mol NH <sub>3</sub>		

b. What is the mass in grams of hydrogen required to react with 1.34 moles of nitrogen?

1.34 mol N <sub>2</sub>	3 mol H <sub>2</sub>	2 g H <sub>2</sub>	8.04 g H <sub>2</sub>
1 mol N <sub>2</sub>	1 mol H <sub>2</sub>		

c. How many moles of nitrogen are required to produce 11.7 moles of NH<sub>3</sub>?

11.7 mol NH <sub>3</sub>	1 mol N <sub>2</sub>	2 mol NH <sub>3</sub>	5.85 mol N <sub>2</sub>

d. How many moles of nitrogen are required to produce 11.7 grams of NH<sub>3</sub>?

11.7 gram NH <sub>3</sub>	1 mol NH <sub>3</sub>	1 mol N <sub>2</sub>	0.34 mol N <sub>2</sub>
17 g NH <sub>3</sub>	2 mol NH <sub>3</sub>		

e. How many grams of hydrogen are required to form 3.5 moles of NH<sub>3</sub>?

3.5 mol NH <sub>3</sub>	3 mol H <sub>2</sub>	2 g H <sub>2</sub>	10.5 g H <sub>2</sub>
	2 mol NH <sub>3</sub>	1 mol H <sub>2</sub>	