

## Stoichiometry: 2 Ways – BCA Table vs. Dimensional Analysis

Name: \_\_\_\_\_

Two methods to solve. Both require the mole ratio from the balanced equation.

Date: \_\_\_\_\_

Block: \_\_\_\_\_

Use the following balanced equation to answer Questions 1-4.



1. How many moles of  $CO_2$  will form if 2 mol of  $H_2O$  react?

Want			Given		
B	C	A	B	C	A
2	+ 2	$H_2O \rightarrow CH_4 + CO_2$	given 2 mol	2( $\frac{1}{2}$ ) = 1 mol	given 1 mole $CO_2$

use mole ratio (i.e. coefficients) as a conversion factor

Dimensional Analysis

$$\frac{2 \text{ mol } H_2O}{1 \text{ mol } CO_2} \text{ or } \frac{1 \text{ mol } CO_2}{2 \text{ mol } H_2O}$$

start w/ given, then multiply by appropriate conversion factor

2. What mass in grams of  $CH_4$  would be produced from the complete reaction of 4.00 mol of carbon?

Want			Given		
B	C	A	B	C	A
2	+ 2	$H_2O \rightarrow CH_4 + CO_2$	given 4 mol C	1 mol $CH_4$	2 mol C

Mole Ratio

Dimensional Analysis

$$\frac{2 \text{ mol } CH_4}{4 \text{ mol } C} = \frac{1 \text{ mol } CH_4}{2 \text{ mol } C}$$

given 3 sig figs

you try...

Dimensional Analysis

Want			Given		
B	C	A	B	C	A
25	g	$CH_4$	1 mol $CH_4$	16.05 g $CH_4$	16.05 g $CH_4$

Mole Ratio

3. How many moles of  $H_2O$  are needed to produce 25.0 grams of  $CH_4$ ? 3 sig figs

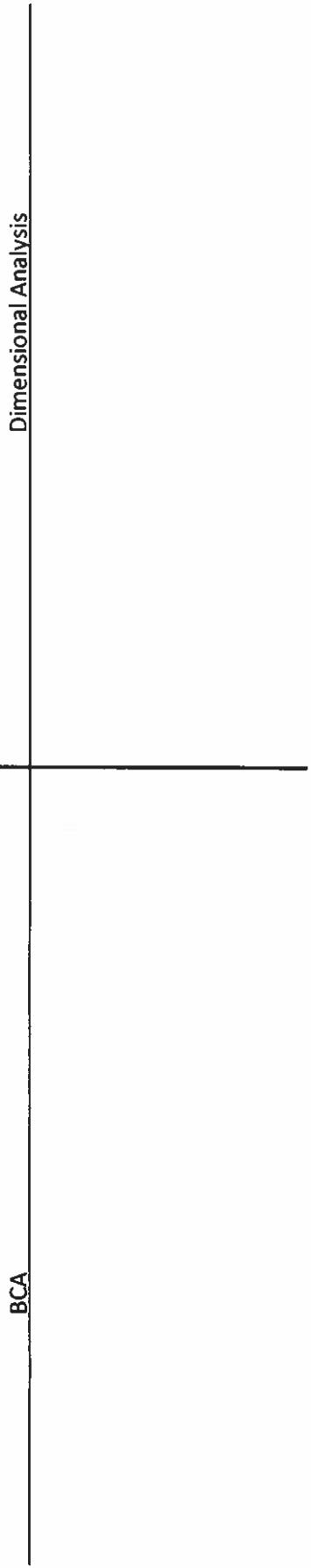
Want		
B	C	A
25	g	$CH_4$

Dimensional Analysis

Want			Given		
B	C	A	B	C	A
2	+ 2	$H_2O \rightarrow CH_4 + CO_2$	given 3.12 mol $H_2O$	1.5576 mol	1.5576 ( $\frac{2}{1}$ )



4. How many grams of CO<sub>2</sub> will form from the complete reaction of 56.7 grams of H<sub>2</sub>O?



5. How many grams of ammonia, NH<sub>3</sub>, are produced when  $3.6 \times 10^{23}$  molecules of nitrogen react with hydrogen?

YOU CHOOSE: BCA OR DIMENSIONAL ANALYSIS. CAN'T DECIDE? TRY BOTH ☺

6. When sulfur dioxide reacts with oxygen at STP, how many molecules of oxygen are needed to produce 19.8 L of sulfur trioxide?  
YOU CHOOSE: BCA OR DIMENSIONAL ANALYSIS. CAN'T DECIDE? TRY BOTH ☺