

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?

Dimensional Analysis

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

Start w/ given, then multiply by appropriate conversion factor

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

Given: 2 mol H_2O | 1 mol CO_2 = 1 mol CO_2

3 sig figs

BCA Table

Want	given	
B	2C	+ 2H ₂ O → CH ₄ + CO ₂
C	given 2 mol	
A	want	2(1/2) = 1 mol

1 mole CO_2

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

Dimensional Analysis

4 mol C | 1 mol CH_4 = 2 mol CH_4

2 mol CH_4 | 16.05 g CH_4 = 32.1 g CH_4

3 sig figs

BCA Table

given		
B	2C	+ 2H ₂ O → CH ₄ + CO ₂
C	given 4 mol	
A	convert	4(1/2) = 2 mol

2 mol CH_4 | 16.05 g CH_4 = 32.1 g CH_4

3 sig figs

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

Dimensional Analysis

25 g CH_4 | 1 mol CH_4 = 1.5576 mol CH_4

16.05 g CH_4

25 g CH_4 + 2H₂O → CH₄ + CO₂

1.5576(2) = 3.1152 = 3.12 mol H_2O

3 sig figs

YOU TRY...

BCA Table

want	given	
B	25 g CH_4	+ 2H ₂ O → CH ₄ + CO ₂
C	1.5576(2)	
A	3.1152	

3.12 mol H_2O

3 sig figs



4. How many grams of CO_2 will form from the complete reaction of 56.7 grams of H_2O ?

BCA

Dimensional Analysis

5. How many grams of ammonia, NH_3 , are produced when 3.6×10^{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? $2 \text{SO}_2 + \text{O}_2 \rightarrow 2 \text{SO}_3$

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