Stoichiometry (IB Chem Chapter 1) Cheat Sheet

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Formulas

No. of molecules = n [no. of moles] x A [Avogadro's Constant]	No. of moles (n) = Mass (m)/ Molar Mass (Mr)
No. of Atoms = No. of Molecules [n x A] x Atomicity	No. of moles (n) = Volume (dm3) / Molar volume (STP or RTP)
% yield = [Experimental yield/ Theoretical Yield] x 100	C [molarity] = no. of moles [n]/ Volume of concentration [v]
Ideal Gas Law - PV = nRT	Volume/concentration constant - C1V1 = C2V2

Finding Percentage Yield of a Reaction

Note: % yield always applies on PRODUCTS

1: In any situation, first determine which of the products is the limiting reagent

2: Using the compound which is limiting, form a ration such that [limiting reactant : product]

3: Under the ratio, write the coefficient ratio of reactant : product

4: Add the molar mass OF 1 MOLE

5: Multiply the Molar mass with the number of moles = mass value

6: Cross multiply to find the THEORETICAL YIELD

7: Use the mass of the product given in the question - (EXPERIMENTAL YIELD)

8: Substitute in the formula: **[Experimental Yield/ Theoretical Yield] x 100** to find % yield

How to Find the Limiting Reagent

Step 1: Write down the whole equation

Step 2: Balance the entire equation

Step 3: Using the balanced equation, determine the coefficient ratio of the reactants

Step 4: Write down the ratios of the values given in the question

Step 5: Convert the amounts to moles

Step 6: divide the values (mole ratio / coefficient ratio)

Ans: The smallest value is the limiting reagent

Ideal Gas Law

PV = nRT; where

P - Pressure (Pa)

V = Volume (m^3)

T - Temperature (K) *Take celsius value and + 273

R - Constant (8.31 JK/mol)

n - no. of moles (mol)

Molar Volume Values

STP - Standard Temperature and Pressure	RTP - Room Temperature and Pressure
Temp.: 0 degrees Celsius	Temp.: 20 degrees Celsius
Pressure: 1 atm	Pressure = approx. 1atm
Volume: 22.7 dm3	Volume: 24 dm3

Ideal Gas vs. Real Gas

Ideal Gas	Real Gas
Obeys all gas laws	All properties change
No forces of attraction	Forces of attraction
Collide in straight lines	Collision in random motion
No mass or volume	
High Temperature	Low Temperature
Low Pressure	High Pressure
High Volume	Low Volume

Steps to Find a Standard Solution

Standard Solution: a solution of accurately known concentration

Step 1: Weigh a known amount of solute

Step 2: Dissolve the Solute in a minimal amount of water

Step 3: Transfer the solution to a volumetric flask without washing

Step 4: Make the solution fill the flask till the meniscus reaches accurate value

Step 5: Place stopper and invert into mix solution

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