YAKEEN NEET 2.0

2026

Some Basic Concept of Chemistry

Physical Chemistry | Lecture -07

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Topics to be covered

1. Revision of Last Class
2. %age yield, %age purity
3. Limiting Reagent
4. ★★★★★ Trick for fast calculation
5. MPQ (Magarmach Practice Questions) & Home work from Modules

Rules to Attend Class

1. Always sit in a peaceful environment with headphone and be ready with your copy and pen.
2. Never ever attend a class from in between or don't join a live class in the middle of the chapter.
3. Make sure to revise the last class before attending the next class & always complete your home work.
4. Never ever engage in chat whether live or recorded on the topic which is not being discussed in current class as by doing so u can be blocked by the admin team or your subscription can be cancelled.

Rules to Attend Class

5. Try to make maximum notes during the class if something is left then u can use the notes pdf after the class to complete the remaining class.
6. Always ask your doubts in doubt section to get answer from faculty. Before asking any doubt please check whether same doubt has been asked by someone or not.


There is one big flaw in your Preparation that's name is Backlog ? What do we say to Backlog ?
NOT TODAY !!!

Revision of Last class

S.C.

$$1N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$$

① given n (g) → n_g

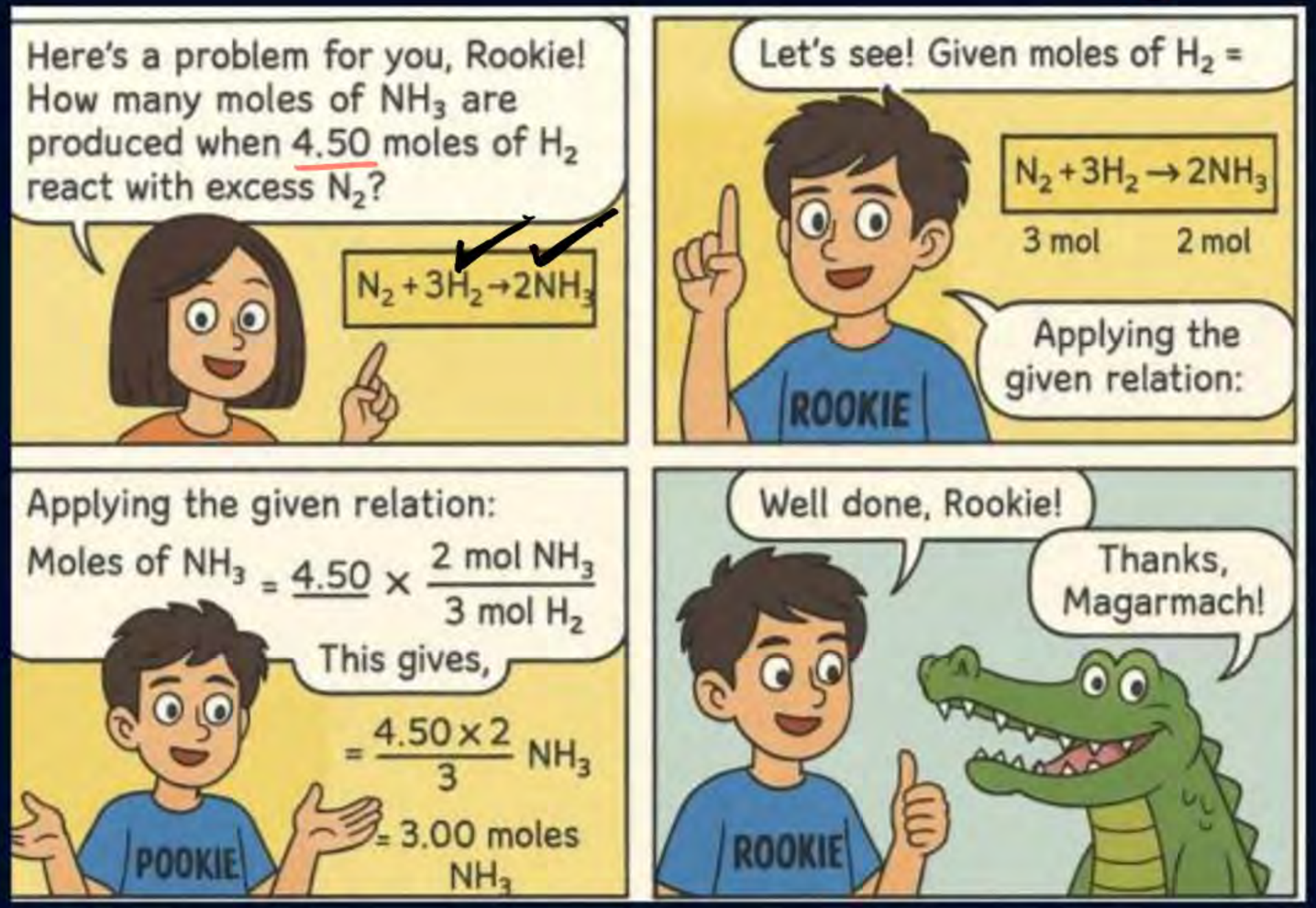
② $\frac{(S.C.)_f}{(S.C.)_i} = \frac{n_f}{n_g}$

③ mass = $n_f \times$ G.M.M.

molecules = $n_f \times N_A$

Vol. gas NTP = $n_f \times 22.4$ L

$$\frac{2}{3} = \frac{n_{NH_3}}{4.5} \Rightarrow n_{NH_3} = \frac{4.5 \times 2}{3} = \frac{1}{3} = 3$$



$$1C_xH_y(g) + \left(x + \frac{y}{4}\right)O_2(g) \rightarrow x\,CO_2(g) + \frac{y}{2}H_2O(l)$$

$$\text{Vol. Cont.} = 1 + x + \frac{y}{4} - x$$

$$= 1 + \frac{y}{4}$$

Balancing of Combustion of Organic Compounds

$$1C_xH_yO_z(g) + \left(x + \frac{y}{4} - \frac{z}{2}\right)O_2(g) \longrightarrow xCO_2(g) + \frac{y}{2}H_2O(l)$$

Vol. Contraction from 1 L of $C_xH_yO_z(g) = \left(1 + x + \frac{y}{4} - \frac{z}{2}\right) - x = \left(1 + \frac{y}{4} - \frac{z}{2}\right)$ L

$$1C_3H_6O(g) + 4O_2(g) \longrightarrow 3CO_2(g) + 3H_2O(l)$$

$3 + \frac{6}{4} - \frac{1}{2} = 4$

Vol. Cont. from 1L $= (1 + 4) - 3 = 2$ L

$$1C_xH_yN_z(g) + \left(x + \frac{y}{4}\right)O_2(g) \longrightarrow xCO_2(g) + \frac{y}{2}H_2O(l) + \frac{z}{2}N_2(g)$$

Vol. Contraction for 1 L of $C_xH_yN_z = \left(1 + x + \frac{y}{4}\right) - \left(x + \frac{z}{2}\right)$ L

$$1C_3H_9N_1(g) + \frac{21}{4}O_2(g) \longrightarrow 3CO_2(g) + \frac{9}{2}H_2O(l) + \frac{1}{2}N_2(g)$$

$3 + \frac{9}{4}$

$\frac{12+9}{4} = \frac{21}{4}$

Vol. Contraction for 1 L of $C_3H_9N(g) = \left(1 + \frac{21}{4}\right) - \left(3 + \frac{1}{2}\right)$ L

$= \frac{25}{4} - \frac{7}{2} = \frac{25-14}{4} = \frac{11}{4}$ L

Question

The volume of oxygen required for complete combustion of 20 ml of ethene is

$C_2H_4(g) + 3O_2(g) \longrightarrow 2CO_2(g) + 2H_2O(l)$

$2 + \frac{4}{4} = 3$

1 ml. $\longrightarrow$ 3 ml.

20 ml $\longrightarrow$ 20 × 3 = 60 ml

(A) 30 ml

(B) 60 ml

(C) 40 ml

(D) 50 ml

Question

^{40}Ca, ^{12}C, ^{1}H, ^{16}O $\quad M_{CaC_2} = 40 + 24 = 64$

The volume of gas at STP produced by 100 g of CaC_2 with water.

$$CaC_2(s) + 2H_2O(l) \longrightarrow C_2H_2(g) + Ca(OH)_2(aq.)$$

A. 70 litre

B. 35 litre

C. 17.5 litre

D. 22.4 litre

① $n_{CaC_2} = \frac{100}{64} = \frac{50}{32} = \frac{25}{16}$

② $\frac{1}{1} = \frac{1}{1} = \frac{n_{C_2H_2}}{25} \Rightarrow n_{C_2H_2} = \frac{25}{16}$

Vol. of C_2H_2 at STP

$= \frac{25}{16} \times 22.4\ L$

$\frac{\cancel{24}^{6}}{\cancel{16}_{4}}^{3} = 1.5$

4×2

Question

^{137}Ba, ^{12}C, ^{16}O

$M_{BaCO_3} = 137 + 12 + 3 \times 16 = 197$

Volume of CO_2 obtained at STP by the complete decomposition of 9.85 g of $BaCO_3$ is:

$1\,BaCO_3(s) \xrightarrow{\Delta} BaO(s) + 1\,CO_2(g)$ (at STP)

A. 2.24 lit

B. 1.12 lit

C. 0.84 lit

D. 0.56 lit

① $n_g = \frac{9.85}{197 \times 100} = 0.05$

② $\frac{1}{1} = \frac{n_{CO_2}}{0.05} = n_{CO_2} = 0.05$

③ Vol of $CO_2 = \frac{0.05}{20} \times 22.4\,L = 1.12\,L$

%age Purity

#MIT

reactant ≠ 100% Pure

pure mass = ?

mass of pure substance = %ge purity × total mass

↓

all Calc. doneacc. to it.

$\frac{70}{100} \times 200 = 140g$

(Impurity)

Bhoosa = 98g

Dimaag = 2g

Total mass = 100g

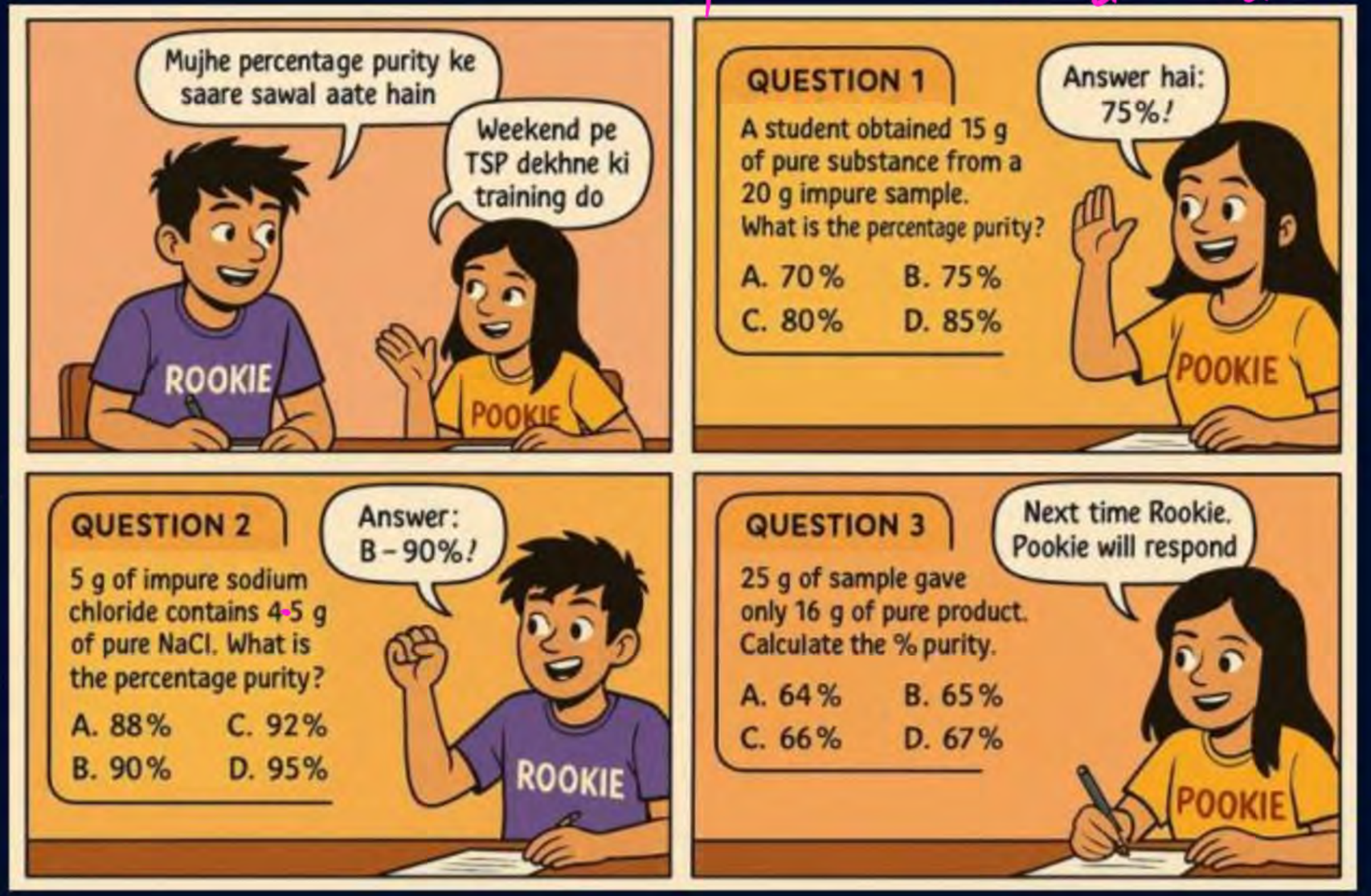
%age purity of your Brain.

$= \frac{\text{mass of pure Dimaag}}{\text{Total mass}} \times 100$

$= \frac{2}{100} \times 100 = 2\%$

% purity = 15 / 20 × 100

= 3/4 × 100 = 300/4 = 75%



% purity = 45/5 × 10 = 9 × 10 = 90%

Q find mass of $CaSO_4$ formed if 80% pure 1000 g $CaCO_3$ react with excess of H_2SO_4?

$$1\,CaCO_3 + H_2SO_4 \rightarrow 1\,CaSO_4 + CO_2(g) + H_2O(l)$$

mass of pure $CaCO_3 = \frac{80}{100} \times 1000 = 800\,g$

$M_{CaCO_3} = 100\,g$

$M_{CaSO_4} = 136\,g$

$n_{CaCO_3} = \frac{800}{100} = 8$

$$\frac{1}{1} = \frac{n_{CaSO_4}}{8}$$

$n_{CaSO_4} = 8$

Mass $CaSO_4 = 8 \times 136\,g = 1088\,g = 1.088\,Kg$

Question (NCERT: PL-20 | NV, JEE Main April 04, 2025 (II))

The amount of calcium oxide produced on heating 150 kg limestone (75% pure) is _____ kg. (Nearest integer)

Given : Molar mass (in g mol^{-1}) of Ca – 40, O – 16, C – 12.

CaO

CaCO3

Ans $\text{mass pure } CaCO_3 = \frac{75}{100} \times 150 = \frac{450}{4}\ kg = \frac{450 \times 1000}{4}\ kg$ (250)

$= 112500$

$n_{CaCO_3} = \frac{112500}{100} = 1125$

$CaCO_3 \xrightarrow{\Delta} CaO + CO_2$

32
1125
x25
11125

$\frac{1}{1} = \frac{n_{CaO}}{1125}$

$n_{CaO} = 1125$

$\text{mass } CaO = 1125 \times 56\ g = \frac{1125 \times 56}{1000}\ kg$

$M_{CaO} = 40 + 16 = 56\ g$

Q. if 60% pure 10 g Hg is taken with excess of O_2 to form water liquid. find Volume of H_2O formed

$M_{Hg} = 2$ g

$M_{H_2O} = 18$ g

Ans $2Hg(g) + 1O_2(g) \rightarrow 2H_2O(l)$

g ↓ , f ↓

mass pure Hg $= \frac{60}{100} \times 10 = 6$ g

$n_{Hg} = \frac{6}{2} = 3$

$\frac{2}{2} = \frac{n_{H_2O}}{3}$

$n_{H_2O} = 3$

mass $H_2O = 3 \times 18 = 54$ g

mass ↑ g = Vol. ↓ ml × d → (1 g/ml)

54 g = Vol(ml) × 1 g/ml

Vol(ml) = 54

%age Yield

$\frac{7}{10} \times 100 = 70\%$

#MIT

$$\%\text{ge yield} = \frac{\text{actual yield}}{\text{Theotsrical yield}} \times 100$$

$\therefore$ Calculations

PERCENTAGE YIELD

Kiye ya nahi KIYE?

Q.1 Actual yield always equals theoretical yield?

(A) Sahi
(B) Galat

2. Percentage yield = 90%. Which is correct?

(A) Actual = theoretical
(B) Actual > theoretical
(C) Actual < theoretical
(D) Actual = zero

What's the percentage yield?

3. What's the percentage yield?

(A) 115%
(B) 90%
(C) 85%
(D) 22%

Theoretical yield = 150g

Actual yield = 135g

Theoretical yield = 150g

4. How do you increase percentage yield?

(A) Buy a calculator
(B) Use more reactant
(C) Use sunblock
(D) Lose more product

POOKIE

(3) % age yield $= \frac{135}{150} \times 100$

$= 90\%$.

Q: If 6g of H_2 gives 30g of H_2O on O_2; find % yield?

As % yield of H_2O = $\frac{\text{mass of } H_2O \text{ formed (actual yield)}}{\text{Theotrical yield}} \times 100$

$= \frac{30}{54} \times 100$

$= \frac{500}{9} = 55.55\%$

$2H_2(g) + 1O_2(g) \Rightarrow 2H_2O(l)$

① $n_{H_2} = \frac{6}{2} = 3$

$\frac{2}{2} = \frac{n_{H_2O}}{3} \Rightarrow n_{H_2O} = 3$

mass $H_2O = 3 \times 18 = 54g$

Q. If 34 g of NH_3 formed on α^n with 56 g of N_2 with excess of H_2? find % ge yield of NH_3?

$$1\,N_2(g) + 3\,H_2(g) \longrightarrow 2\,NH_3$$

(1 → g, 2 → f)

$M_{N_2} = 28\,g$

$M_{NH_3} = 17\,g$

Ans

$$n_{N_2} = \frac{56}{28} = 2$$ ✓

$$\frac{2}{1} = \frac{n_{NH_3}}{2}$$

$$n_{NH_3} = 4$$

$$\text{Mass } NH_3 = 4 \times 17 = 68\,g$$

% ge yield $= \frac{34}{68} \times 100 = 50\%$

Q. If 50% pure 600g $CaCO_3$ gives 136g of $CaSO_4$ on rxn with excess of H_2SO_4. find % yield of $CaSO_4$

$M_{CaCO_3} = 100\ g/mole$

$M_{CaSO_4} = 136\ g/mole$

$$\underset{(g)}{1}\ CaCO_3 + H_2SO_4 \Rightarrow \underset{(f)}{1}\ CaSO_4 + H_2O + CO_2$$

(1)

(2) mass pure $CaCO_3 = \frac{50}{100} \times 600 = 300g \Rightarrow n_{CaCO_3} = \frac{300}{100} = 3$

$$\frac{1}{1} = \frac{n_{CaSO_4}}{3}$$

$n_{CaSO_4} = 3$

mass $CaSO_4 = 3 \times 136 = 408g$

% purity $CaSO_4 = \frac{136 \times 100}{408_3}$

$= 33.34\%$

Limiting Reagent (L.R.)

Limiting Reactant
ya
Limiting Reagent (L.R.)

#MIT

1. Substance which is finished.
2. $L.R. = \frac{\text{Moles}}{S.C.} = \text{lowest}$
3. all Calc. → acc. to L.R.

1 Bun + 1 Tikki + 1 Tomato + 1 Cucumber + 5g Sauce ⟶ 1 Burger

10 Bun | 12 Tikki | 15 Nos | 95 Nos | 100g Nos | 5g → 1

100g → $\frac{1}{5}$ × 100 = 20

10 | 12 | 15 | 25 | 20

$\frac{10}{1}$ | $\frac{12}{1}$ | $\frac{15}{1}$ | $\frac{95}{1}$ | $\frac{100}{5} = 20$

10 Burger form.

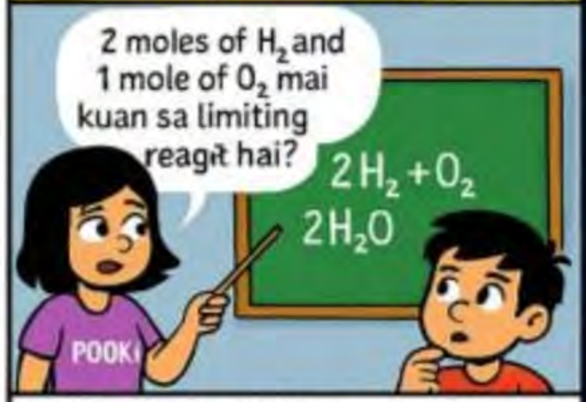
Bun is Limiting Reagent.

SANDWICH STOICHIOMETRY

What is the maximum number of sandwiches Rookle can make?

A. 2 B. 3 C. 4 D. 5

MOLE MATCH

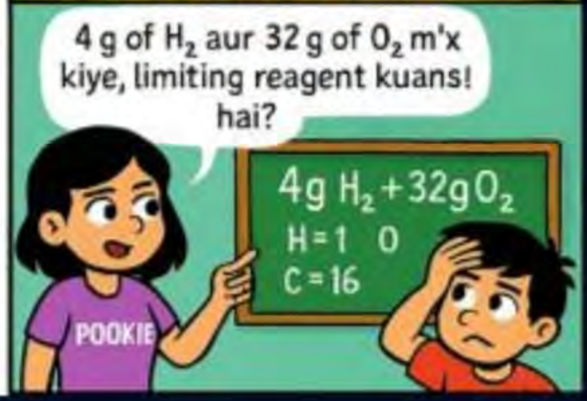


Identify the limiting reagent.

A. H_2 B. O_2 C. H_2O D. D

THE PIZZA PROBLEM

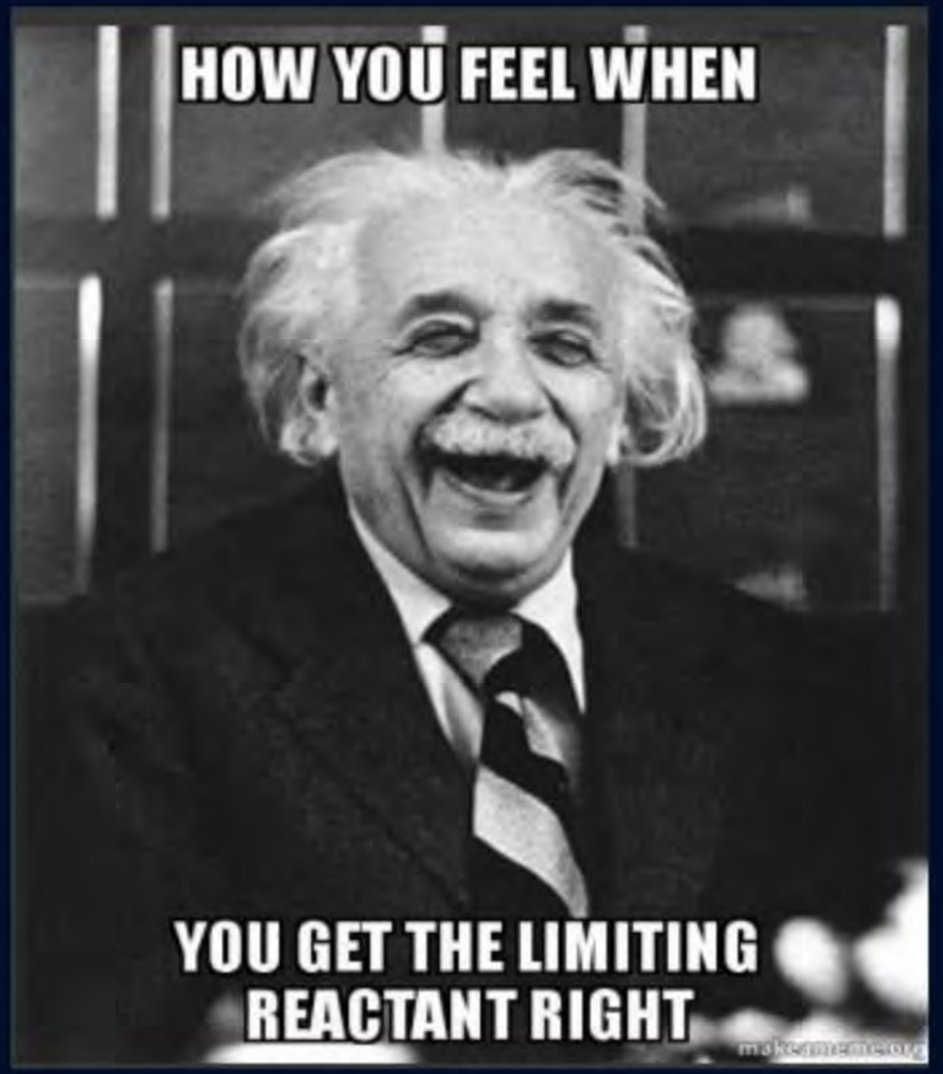
REAL CHEM MIX



Question

1 mole each of N_2 and H_2 react to form NH_3. Calculate moles of NH_3 formed.

[NCERT Exemplar]



QUESTION – (AIPMT 2014)

When 22.4 litres of $H_2(g)$ is mixed with 11.2 litres of $Cl_2(g)$, each at STP, the moles of HCl(g) formed is equal to:

A. 0.5 mol of HCl(g)

B. 1.5 mol of HCl(g)

C. 1 mol of HCl(g)

D. 2 mol of HCl(g)

QUESTION – (AIPMT 2014)

1.0 g of magnesium is burnt with 0.56 g O_2 in a closed vessel. Which reactant is left in excess and how much:

(At. Wt. Mg = 24; O = 16)

A Mg, 0.44 g

B O_2, 0.28 g

C Mg, 0.16 g

D O_2, 0.16 g

Question

The reaction $2C + O_2 \longrightarrow 2CO$. Is carried out by taking 24 g of carbon and 96 g O_2. Find out Limiting Reagent & [NCERT Exemplar]

(a) Which reactant is left in excess?

(b) How many moles of CO are formed?

(c) How many grams of other reactant is left ?

Question (NCERT: PL-20 | NV, JEE Main Jan. 24, 2025 (I))

Consider the following reaction occurring in the blast furnace.

$Fe_3O_{4(s)} + 4CO_{(g)} \rightarrow 3Fe_{(l)} + 4CO_{2(g)}$

'x' kg of iron is produced when 2.32×10^3 kg Fe_3O_4 and 2.8×10^2 kg CO are brought together in the furnace. The value of 'x' is _____ (nearest integer)

{Given : Molar mass of $Fe_3O_4 = 232$ g mol^{-1}

Molar mass of $CO = 28$ g mol^{-1}

Molar mass of $Fe = 56$ g mol^{-1}}

Question (NCERT: PL-19 | NV, JEE Main July 28, 2022 (I)

In the given reaction, $X + Y + 3Z \rightleftarrows XYZ_3$ if one mole of each of X and Y with 0.05 mol of Z gives compound XYZ_3. (Given : Atomic masses of X, Y and Z are 10, 20 and 30 amu, respectively). The yield of XYZ_3 is _____ g. (Nearest integer)

(Backlog)

Revise → revision target → 6 a.m. to 7 a.m.

↓

Notes → official telegram Channel link

↓

Scan → Join.

↓

Link → 6 a.m.

Join this telegram Channel to get link for Revision Class at 6 a.m.

Home work from modules

Train your Brain → example 15

Concept application → 17, 18

Magarmach Practice Questions (MPQ)

Question (NCERT: PL-20 | NV, JEE Main July 25, 2022 (II)

56.0 L of nitrogen gas is mixed with excess of hydrogen gas and it is found that 20 L of ammonia gas is produced. The volume of unused nitrogen gas if found to be _____ L.

Question (NCERT: PL-20 | JEE Main April 03, 2025 (II))

Mass of magnesium required to produce 220 mL of hydrogen gas at STP on reaction with excess of dil. HCl is Given : Molar mass of Mg is 24 g mol^{-1}.

(A) 235.7 g

(B) 0.24 mg

(C) 236 mg

(D) 2.444 g

Question (NCERT: PL-20 | NV, JEE Main Jan. 27, 2025 (I))

Xg of benzoic acid on reaction with aq. $NaHCO_3$ release CO_2 that occupied 11.2 L volume at STP. X is _____ g.

Question (NCERT: PL-20 | JEE Main Jan. 23, 2025 (I))

What amount of bromine will be required to convert 2 g of phenol into 2, 4, 6-tribromophenol?
(Given molar mass in g mol^{-1} of C. H, O, Br are 12, 1, 16, 80 respectively)

A 10.22 g

B 6.0 g

C 4.0 g

D 20.44 g

Question (NCERT: PL-22 | NV, JEE Main Jan. 27, 2024 (I))

Mass of methane required to produce 22 g of CO_2 after complete combustion is _____ g.

[Given Molar mass in g mol^{-1} ; C = 12.0, H = 1.0, O = 16.0]

Question (NCERT: PL-18 | NV, JEE Main April 13, 2023 (II))

1 g of a carbonate (M_2CO_3) on treatment with excess HCl produces 0.01 mol of CO_2. The molar mass of M_2CO_3 is _____ g mol^{-1}. (Nearest integer)

Question (NCERT: PL-18 | NV, JEE Main April 11, 2023 (II))

The volume of hydrogen liberated at STP by treating 2.4 g magnesium with excess of hydrochloric acid _____ $\times 10^{-2}$ L.

Given : Molar volume of gas is 22.4 L at STP. Molar mass of magnesium is 24 g mol^{-1}.

THANK YOU