Parallel/Sequential Reaction

Course on Mole Concept for Class XI

akhilesh • Lesson 5 • June 12, 2021

$Br_2 + Cl_2 \longrightarrow 2BrCl$

$0.025 \quad 0.025$

$0.025 \times 2 \times \frac{4}{5} = 0.04$.

0.005

~~50 gm~~ ~~25%~~

$0.5\ CO_2$

$0.5\ CaCO_3$

$0.5\ Ca$

$0.5 \times 40 = 20\ gm$

10%

(16) $A + B \longrightarrow$ Compound

$\underline{X \text{ gm}}$ $\underline{Y \text{ atom}}$ 5 molecule

$$X \text{ gm} + \frac{y}{N_A} \times M \text{ gm} = \frac{5}{N_A} \times M_C.$$

23

74 gm

C H O

36 gm 6 gm 32 gm

$\frac{36}{12}$ $\frac{6}{1}$ $\frac{32}{16}$

$\frac{3}{T_2}$

3 6 2

$C_3H_6O_2$

CO_2

132 gm

3 mol

H_2O

3 mol

24) 620 gm $C_2H_4O_2$ + O_2

$C_2H_4O_2 + 2O_2 \longrightarrow 2CO_2 + 2H_2O$

1 mol : 2 mol

60 : 64

15 : 16

15/31 × 620 = 300 gm

320 gm

$8C + 4A \longrightarrow 6B + 10D \quad \Delta H = 100\ kJ/mol$

$4C + 2A \longrightarrow 3B + 5D \quad \Delta H = 50\ kJ/mol$

per mol of Rxn

no. of moles equal to the stoichiometric coeff

(A) When 1 mol A reacts

(B) " 2 mol " / 1 mol B is formed

(C) "

(D) None.

$N_2 + 3H_2 \longrightarrow 2NH_3$ $\quad \Delta H = -100\ kJ/mol$

5 mol $\quad$ 6 mol

5 — 2 mol

① 5 mol N_2 $\quad -500\ kJ$

② 6 mol H_2 $\quad -200\ kJ$

③ 5 mol N_2 + 6 mol H_2

(A) -500

(B) -200

(C) -700

(D) -100

T + 6c → D

1 : 6

5 30

$Fe + Br_2 \longrightarrow FeBr_2$

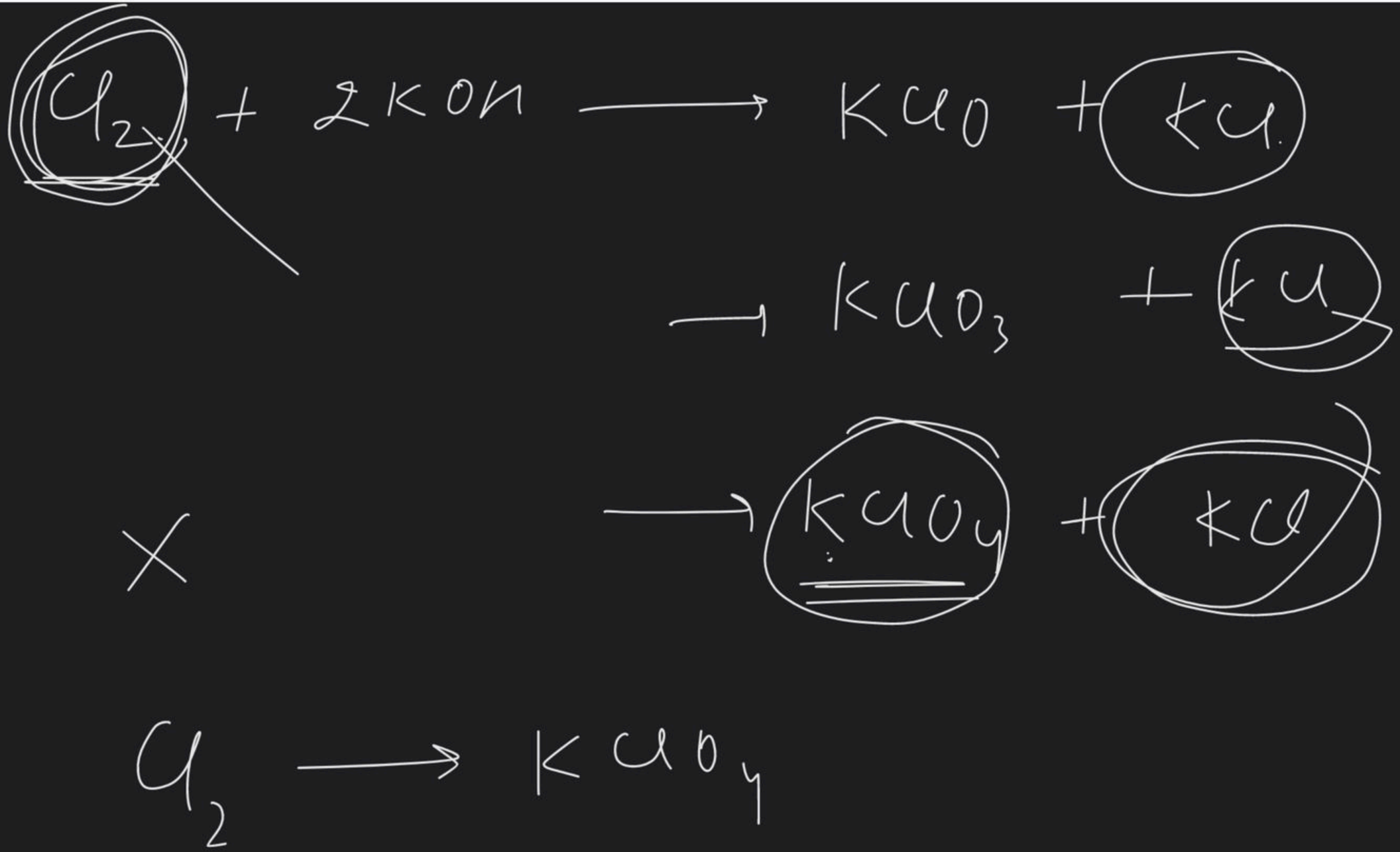
$3FeBr_2 + Br_2 \longrightarrow Fe_3Br_8$

$Fe_3Br_8 + 4Na_2O \longrightarrow Fe_3O_4 + 8NaBr$

POAC

$3Fe \longrightarrow Fe_3O_4$

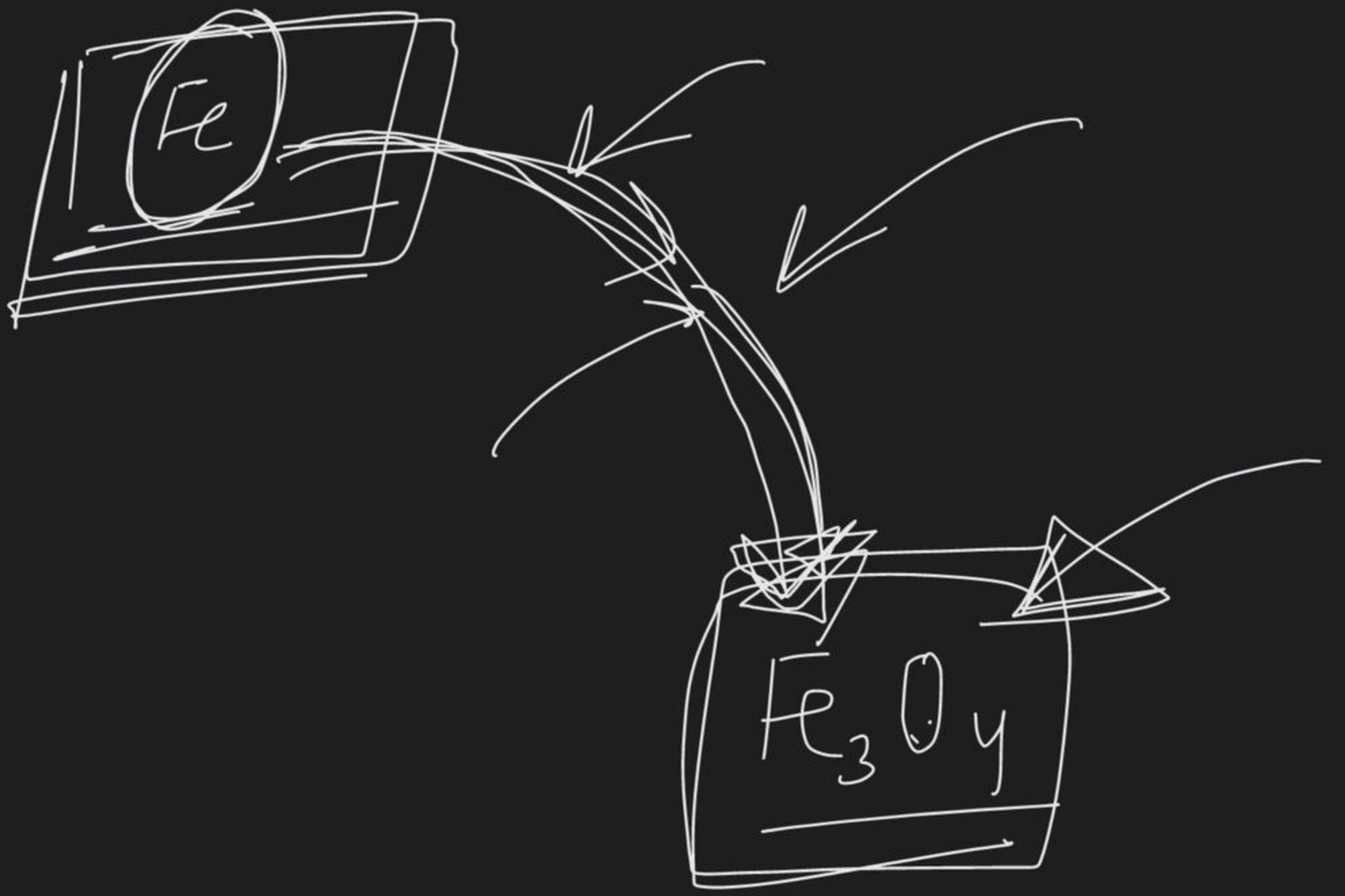
10 mol $\quad$ 10/3.



$Cl_2 \longrightarrow KClO_y$

Quantitative

Qualitative



$12\,K_2CO_3 \rightarrow K_2Zn_3[Fe(CN)_6]_2$

27.6

138

0.2

$\frac{0.2}{12} \times 698$

(A) ~ 139.6

(B) ~ 11.6

(C) None

27.6g K_2CO_3 was treated by a series of reagents so as to convert all of its carbon to $K_2Zn_3[Fe(CN)_6]_2$. Calculate the weight of the product.
[mol. wt. of K_2CO_3 = 138 and mol. wt. of $K_2Zn_3[Fe(CN)_6]_2$ = 698]

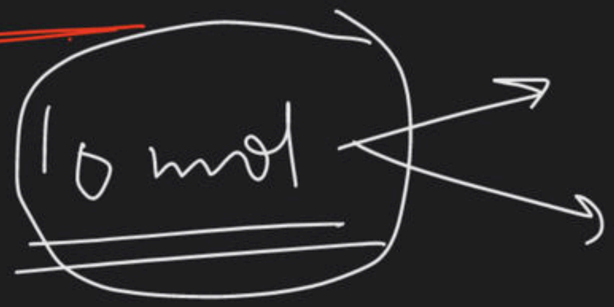
Type-6 problems Problems related with parallel Rxn

$$KClO_3 \longrightarrow KCl + \frac{3}{2}O_2$$

x 4 mol 4 6

$$4KClO_3 \longrightarrow 3KClO_4 + KCl$$

10−x 6 mol 4.5 1.5



40% 1st Rxn

60% 2nd Rxn

$$C + O_2 \longrightarrow CO_2$$

$$C + \frac{1}{2}O_2 \longrightarrow \underline{CO}$$

Depending upon the relative amount of 'C' & O_2, product may be CO, CO_2 or both. If O_2 is in excess amount product will be CO_2, if carbon is in excess amount product will be CO. then find moles of product(s)

(1) 2 mol C + 3 mol O_2

(2) 2 mol C + 0.5 mol O_2 → 1 mol CO

(3) 2 mol C + 1.25 mol O_2

2 mol CO_2

LR

$C + O_2 \longrightarrow CO_2$

2 mol 3 mol

0 3 − 2 = 1 mol 2 mol

$C + \frac{1}{2}O_2 \longrightarrow CO$

2 3 mol

0 2 mol 2 mol

$$CO + \frac{1}{2}O_2 \rightarrow CO_2$$

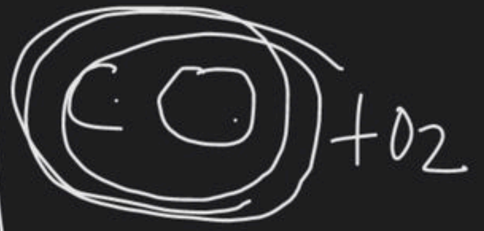
2 mol 2 mol

0	1 mol	2 mol

$$\underline{CO + O_2} \longrightarrow CO_2$$

$$CO_2 + C \longrightarrow CO$$

$CO_2 + C \rightarrow 2CO$



(2)

$$C + \tfrac{1}{2}O_2 \xrightarrow{LR} CO$$

2 mol 0.5

1 mol 0 1 mol

$$\Rightarrow C + O_2 \longrightarrow CO_2$$

$$CO_2 + C \longrightarrow 2CO$$

3

2/1.

2·5

$C + \frac{1}{2}O_2 \longrightarrow \underline{\underline{CO}}$

2 mol 1·25

0 0·25 2 mol

$CO + \frac{1}{2}O_2 \longrightarrow CO_2$

2 mol 0·25

1·5 0 0·5

$C + O_2 \longrightarrow CO_2$

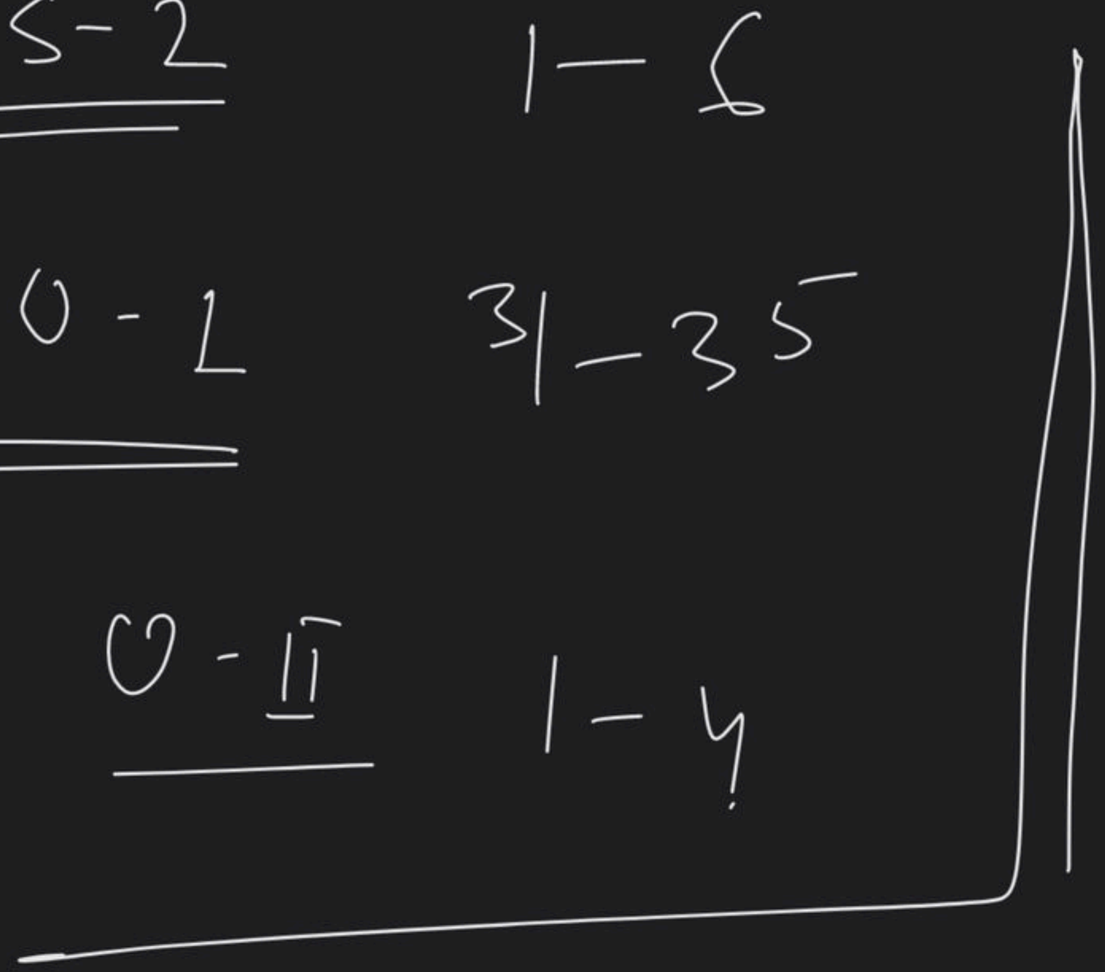
2 mol 1.25

0.75 0 1.25

$CO_2 + C \longrightarrow 2CO$

1.25 0.75

0.5 0 1.5


S-2
1-6
0-1
31-35
0-11
1-4