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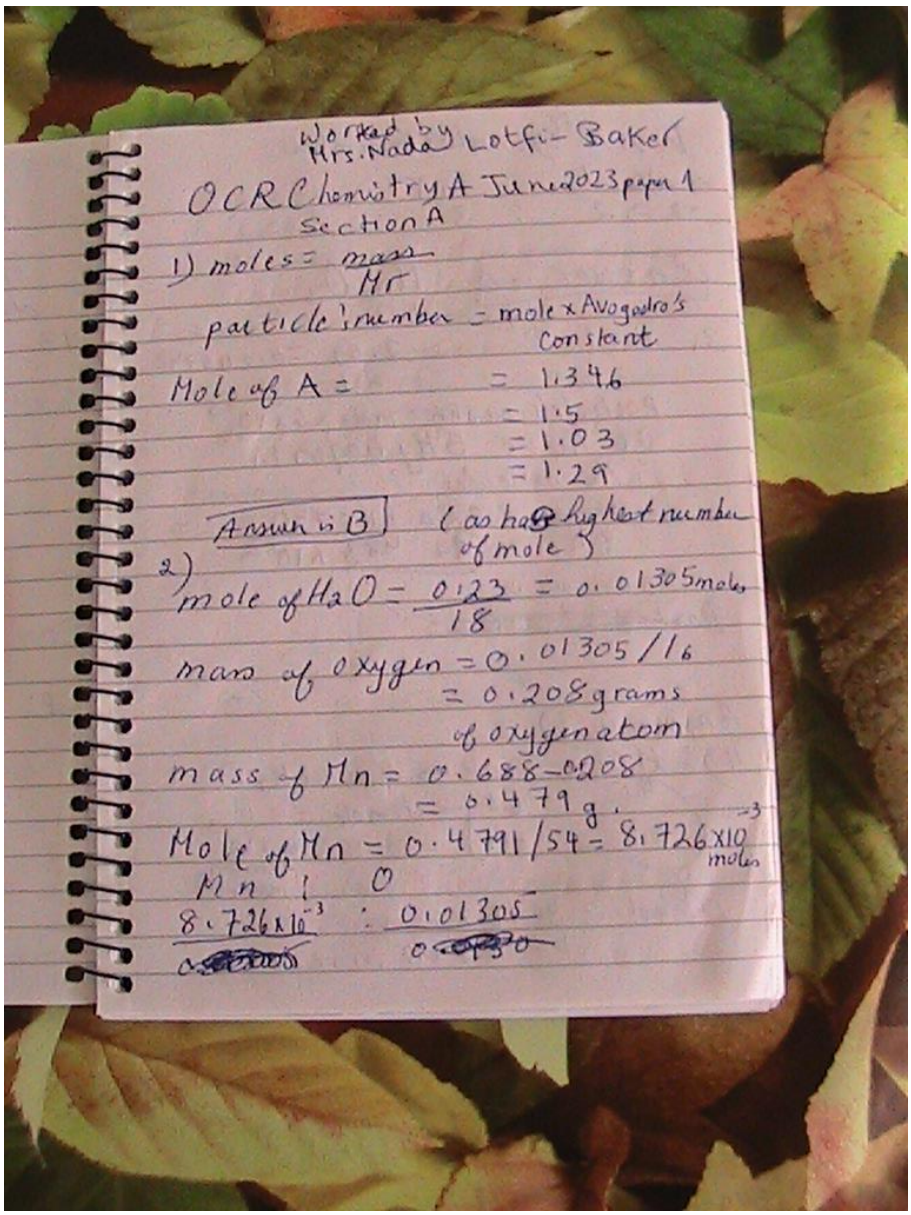
Owner is the tutor : Mrs Nada Lotfi-Baker

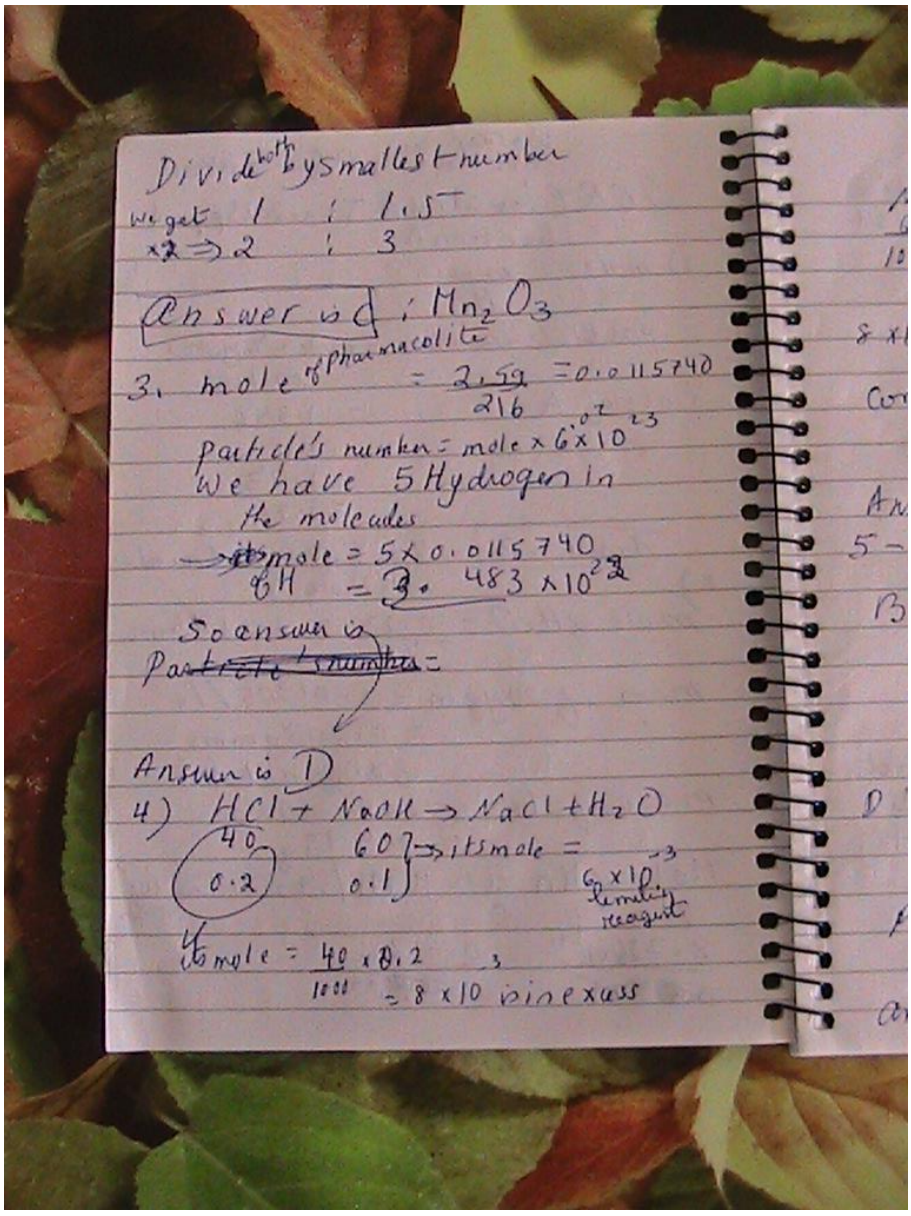
She has done handwritten answers to some questions on paper 2023

Her answers are clearer an dmore apprehensive to students than the mark scheme

OCR A Chemistry A A level June 2023 paper 1

OCR A-Level Chemistry June 2023 Paper 1.pdf (tommo.team)





Divide both by smallest number
We get 1 : 1.5
×2 ⇒ 2 : 3

Answer is C : Mn_2O_3

3. mole of Pharmacolite $= \frac{2.59}{216} = 0.0115740$

particle's number = mole × 6.02×10^{23}
We have 5 Hydrogen in the molecules
mole = 5×0.0115740
$6H = 3.483 \times 10^{22}$

So answer is
~~Particle number~~ =

Answer is D

4) $HCl + NaOH \rightarrow NaCl + H_2O$

40 : 60 ⇒ its mole = 6×10^{-3} limiting reagent
0.2 : 0.1

its mole $= \frac{40 \times 0.2}{1000} = 8 \times 10^{-3}$ in excess

NaCl

6×10^{-3}

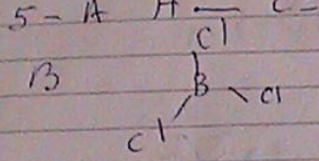
$100 \div 1000$

$= 0.06$

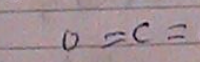
$8 \times 10^{-3} - 6 \times 10^{-3} = 2 \times 10^{-3}$ mol of HCl remaining.

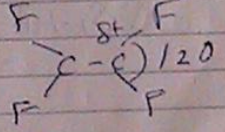
Con HCl $= \frac{2 \times 10^{-3}}{100 \div 1000} = 0.02$ mol dm^{-3}

Answer is C

5 – A 

B

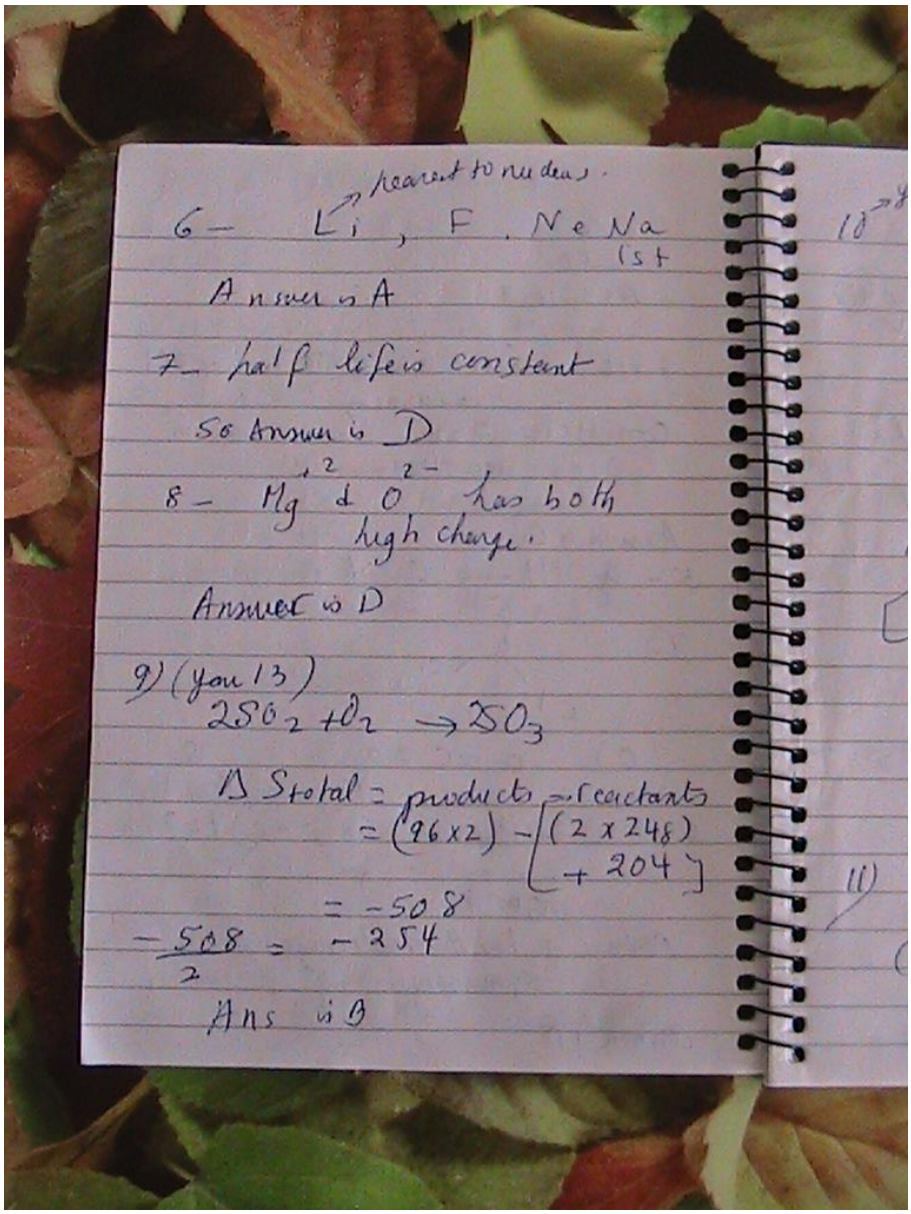
C) 

D: C_2F_4 

means:

Polar : has a electronegativity symmetry

Answer is A



6 – Li (nearest to nucleus), F, Ne, Na (1st)

Answer is A

7 – half life is constant

So Answer is D

8 – Mg^{2} & O^{2-} has both high charge.

Answer is D

9) (you 13)

$2SO_2 + O_2 \rightarrow 2SO_3$

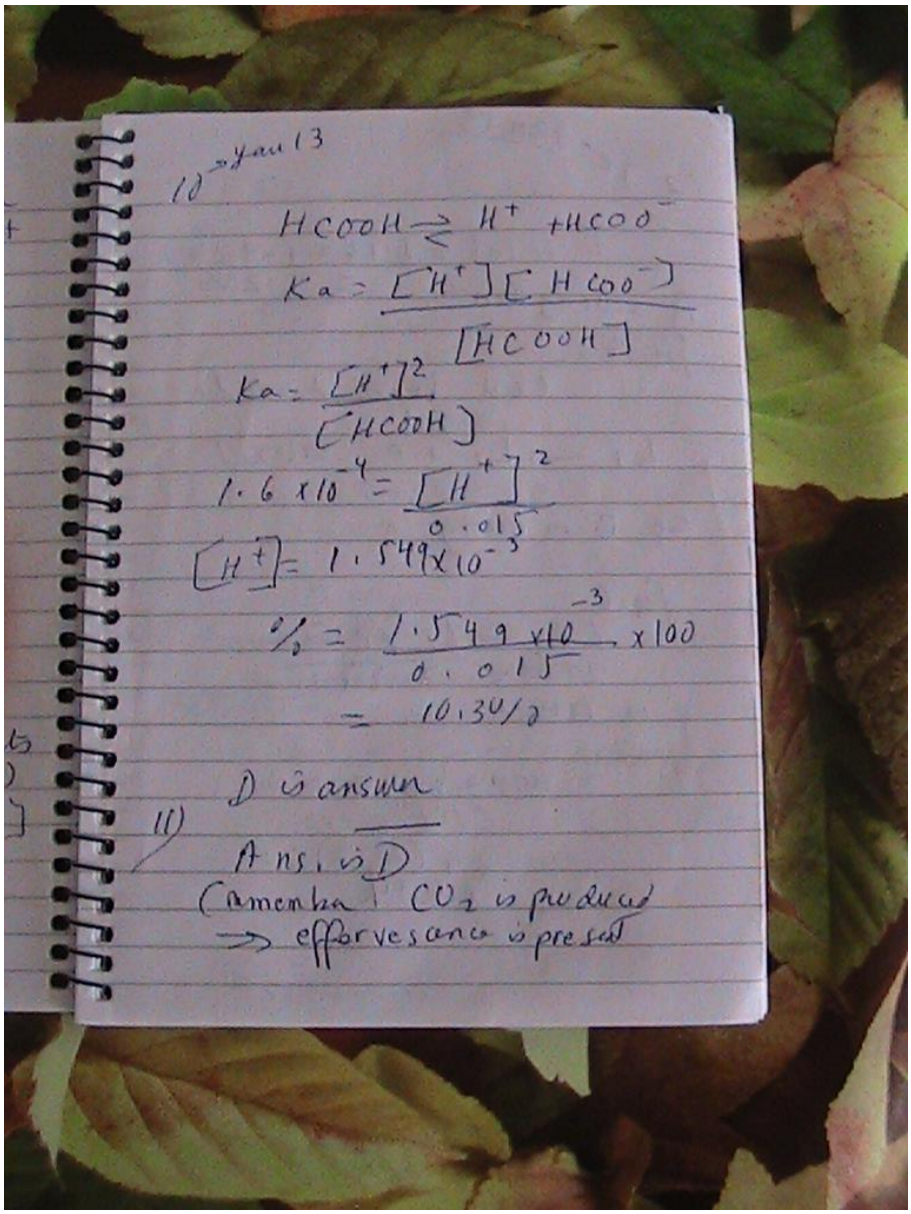
ΔS_{total} = products − reactants

$= (96 \times 2) - [(2 \times 248) + 204]$

$= -508$

$\frac{-508}{2} = -254$

Ans is A



10 - Jan 13

$HCOOH \rightleftharpoons H^+ + HCOO^-$

$K_a = \frac{[H^+][HCOO^-]}{[HCOOH]}$

$K_a = \frac{[H^+]^2}{[HCOOH]}$

$1.6 \times 10^{-4} = \frac{[H^+]^2}{0.015}$

$[H^+] = 1.549 \times 10^{-3}$

$\% = \frac{1.549 \times 10^{-3}}{0.015} \times 100$

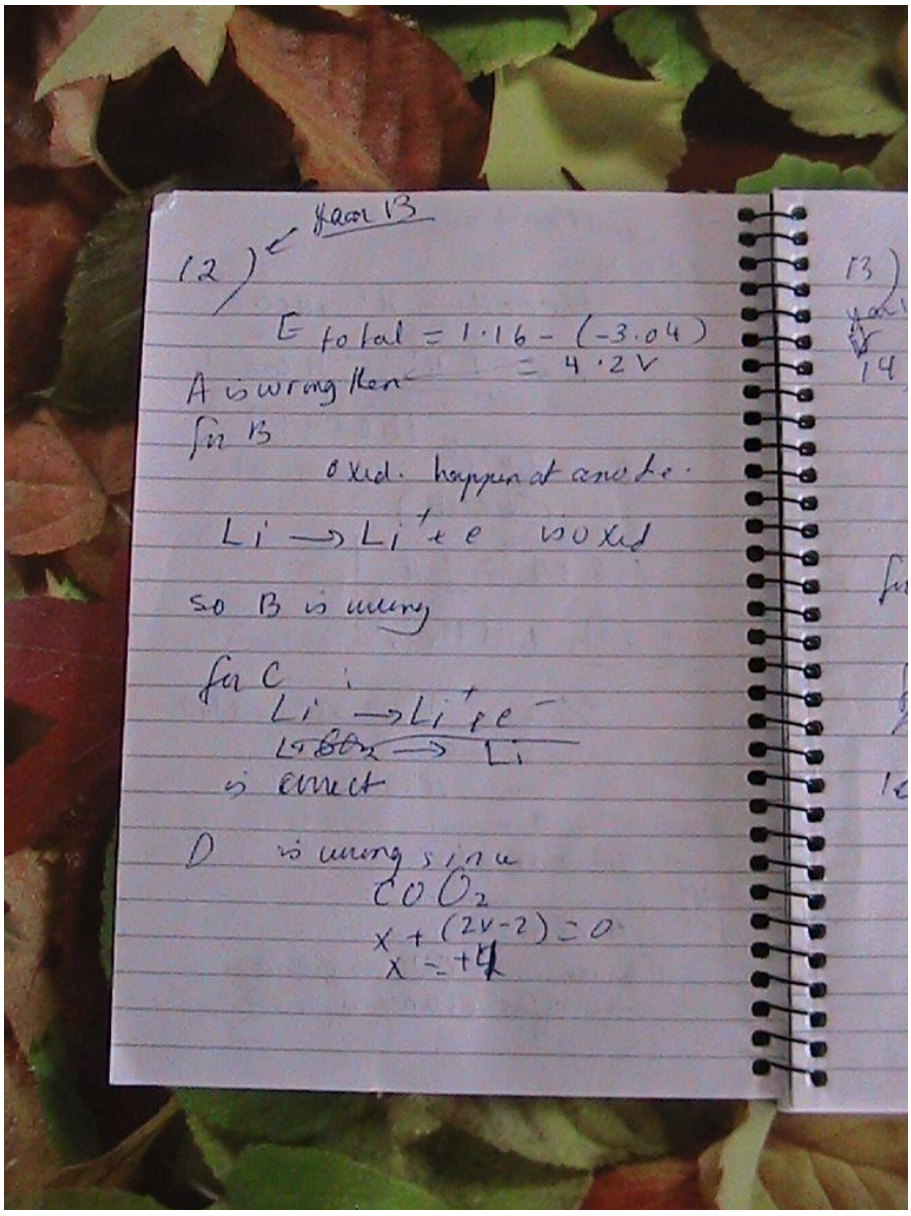
$= 10.3\%$

D is answer

11)

Ans. is D

(Ammonia CO_2 is produced
→ effervescence is present



(12) ← Kaa 13

$E_{total} = 1.16 - (-3.04)$
$= 4.2\,V$

A is wrong ken

for B

oxid. happen at anode.

$Li \rightarrow Li^+ + e$ is oxid

so B is wrong

for C :

$Li \rightarrow Li^+ + e^-$

~~$LiCoO_2$~~ $\rightarrow Li$

is correct

D is wrong since

CO_2

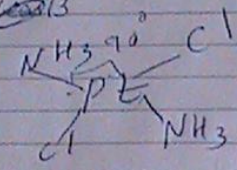
$x + (2v-2) = 0$

$x = +4$

13)

14

13) S1 is not a molecule
Ans 13
14) Answer is B
~~Ans 13~~



solving it

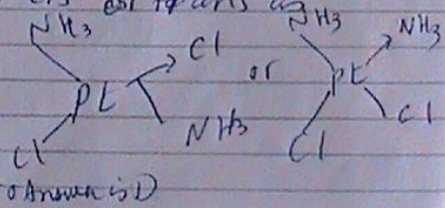
for 2 ; $x + (-2) = 0$

$x = +2$ solving for 2

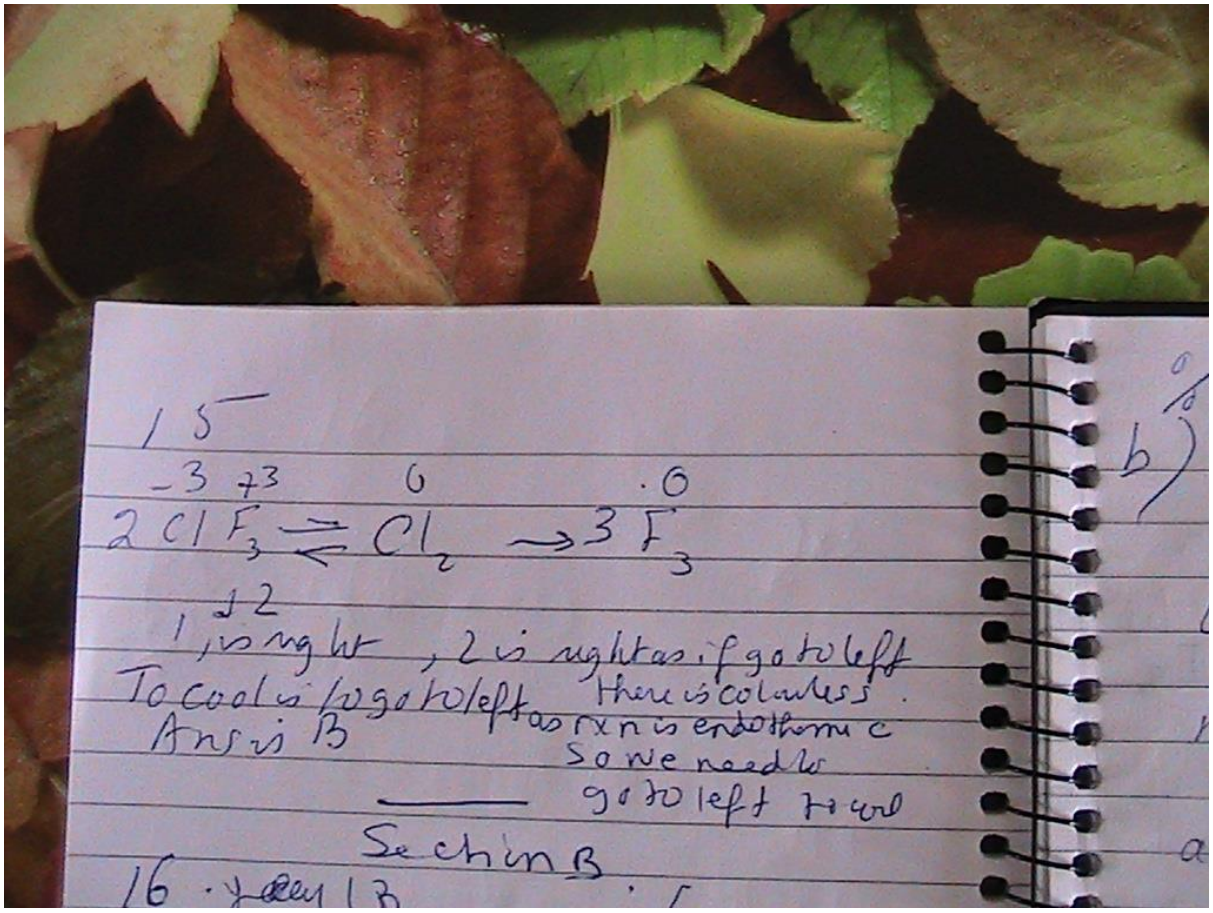
for 3 it's optical but it can be ~~Answer is A~~ (T) cis or trans

~~15) So Answer is D.~~

To be optical there should be a central Carbon it is cis or trans as



So Answer is D



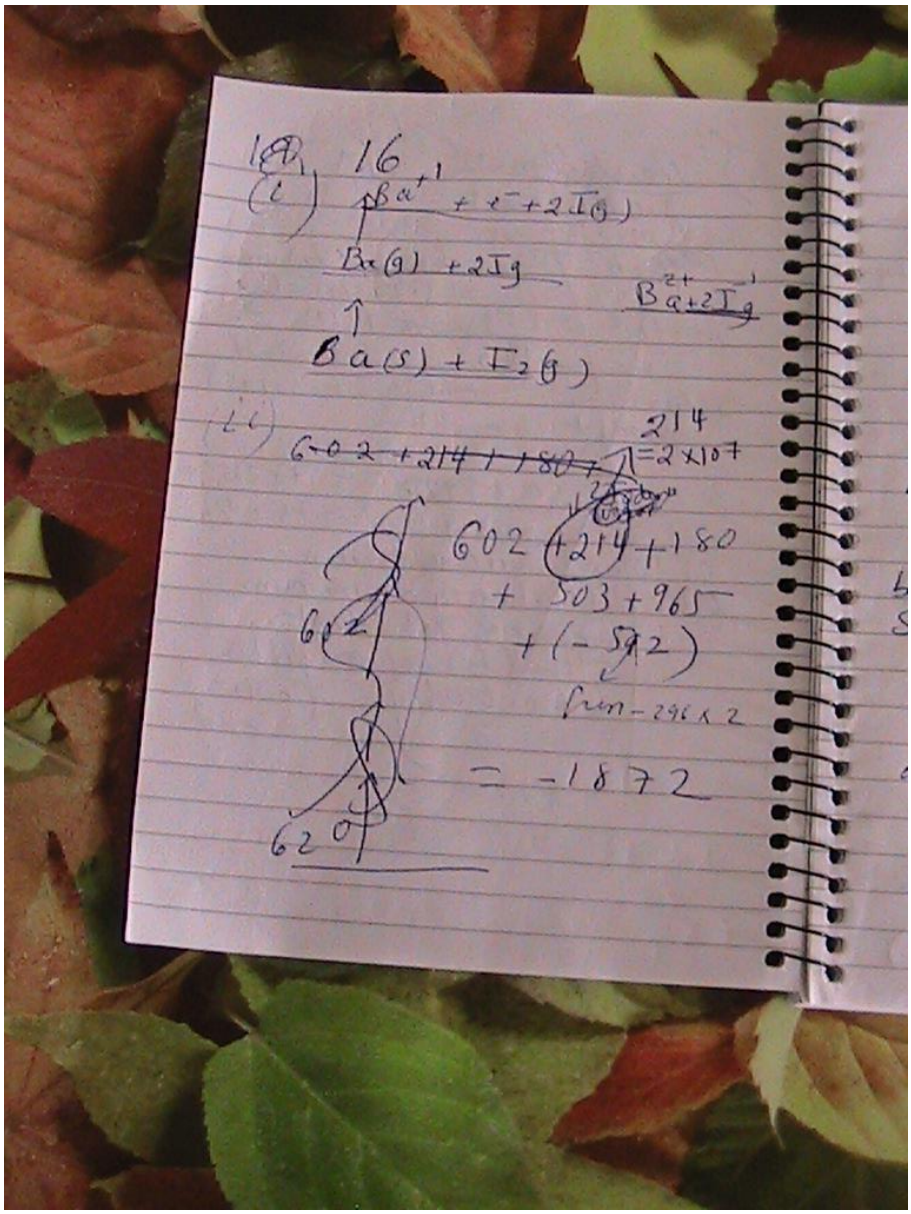
15

$$\overset{-3\ +3}{2ClF_3} \rightleftharpoons \overset{0}{Cl_2} \rightarrow \overset{0}{3F_2}$$

1, is right, 2 is right as if go to left
To cool is to go to left as rxn is endothermic
Ans is B
There is colourless.
So we need to go to left to cool

Section B

16.


16
Ba(s) + I2(g)
602 + 214 + 180
+ 503 + 965
+ (-592)
= -1872
620

17th 08 Aug ... 2

~~Rate of Rexns 1st~~

b – x Mg (in group 2) has fewer (electron) e⁻ shells than Sr (in group)

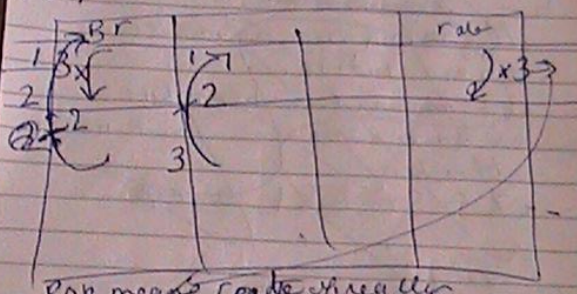
⇒ less shield effect

x ⇒ outshell (of) electron of Mg experience greater nuclear attraction

after $Sr^{2+} \longrightarrow S^{1+} + e^-$ so one e^- left

⇒ experience higher nuclear attraction.

17 year 12 (rate)



ROR means rate of reaction

Using exp 1 & 2, Br^- is the rate is in the first order with respect to Br^-. Because tripling conc. of Br^-, triple R.O.R.

BrO_3^-

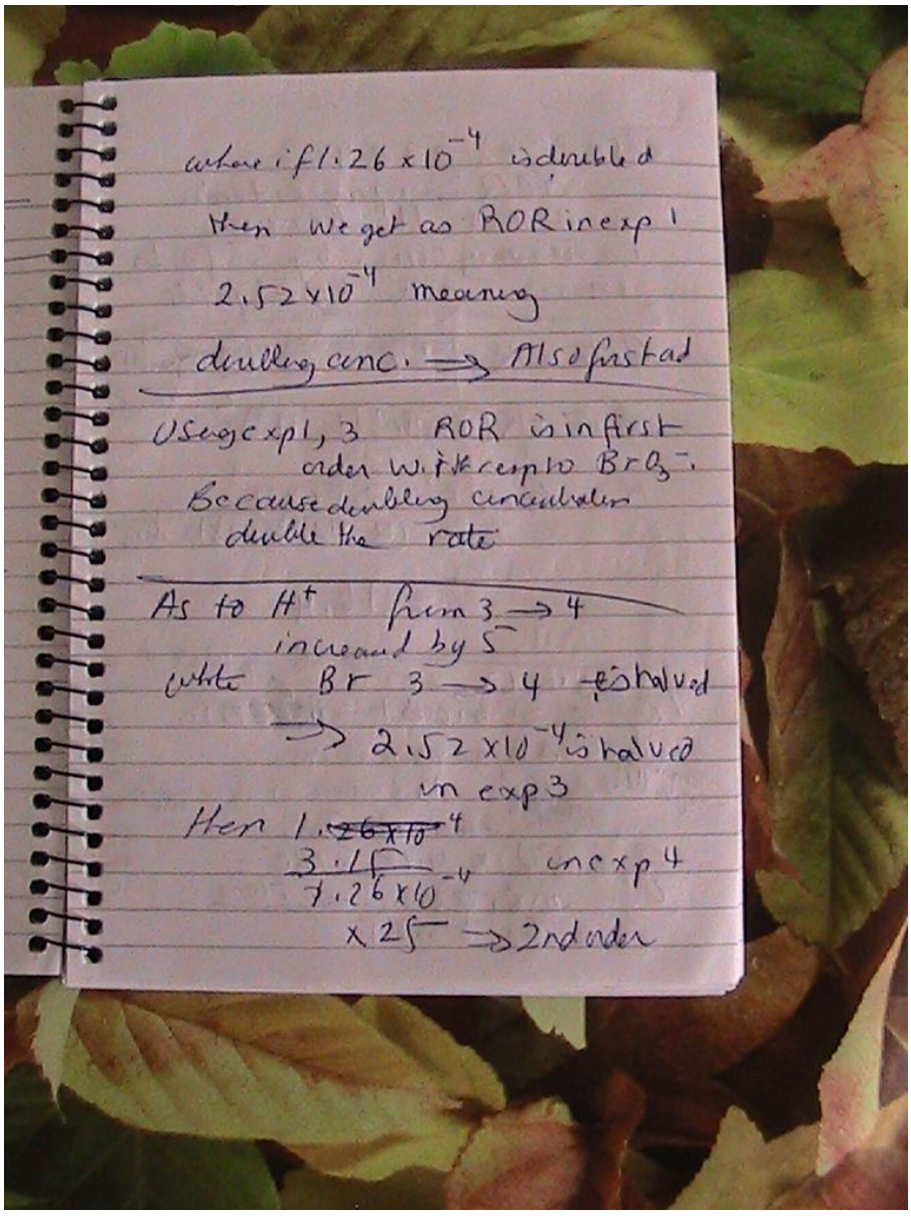
look at 3 going to 1

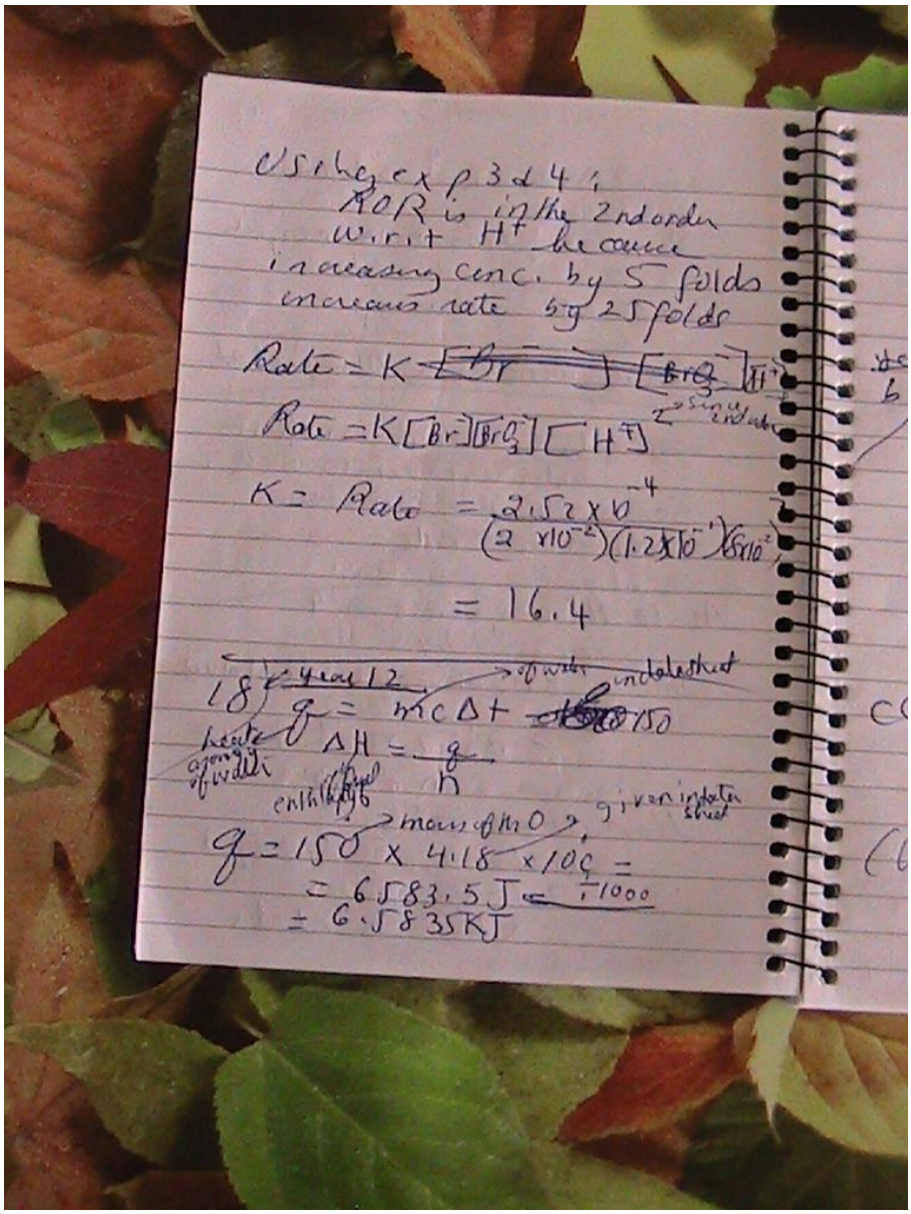
we x2 (the conc)

while for Br^- from 3 → 1 ÷2

so $k = \exp 3 (2.5 \times 10^{-4}) \div 2$

$= 1.26 \times 10^{-4}$ which is


where if 1.26×10^{-4} is doubled
Then we get as ROR in exp 1
2.52×10^{-4} meaning
doubling conc. → Also fastad
Use exp 1, 3 ROR is in first order with resp to BrO_3^-.
Because doubling concentration double the rate
As to H^+ from 3 → 4 increased by 5
while Br 3 → 4 is halved
→ 2.52×10^{-4} is halved in exp 3
Hen $\frac{3.15}{1.26 \times 10^{-4}}$ in exp 4
× 25 → 2nd order



Using exp 3 & 4:
ROR is in the 2nd order w.r.t H^+ because increasing conc. by 5 folds increases rate by 25 folds

Rate = $K[Br^-][BrO_3^-][H^+]$

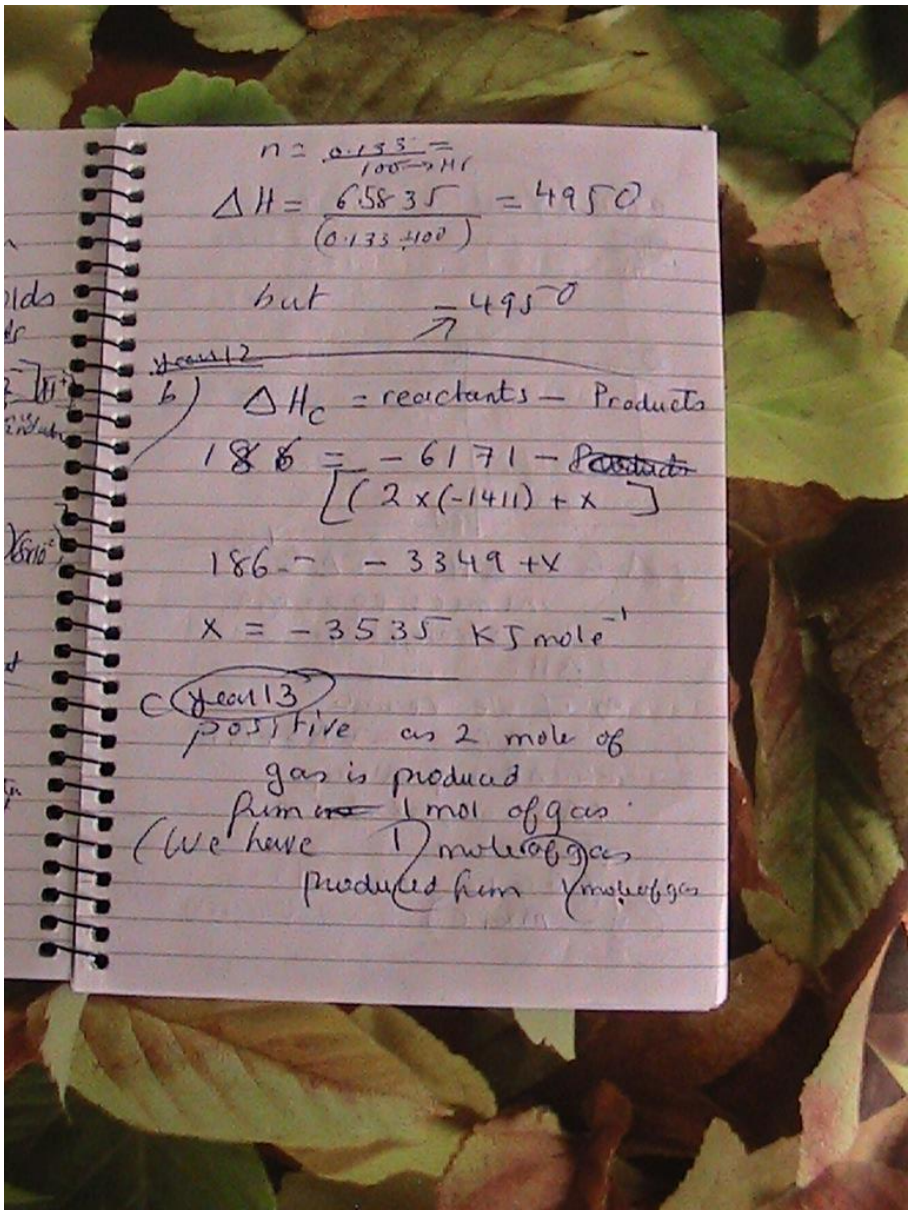
$K = \frac{Rate}{[Br^-][BrO_3^-][H^+]^2} = \frac{2.52 \times 10^{-4}}{(2 \times 10^{-2})(1.2 \times 10^{-1})(5 \times 10^{-2})^2}$

$= 16.4$

18) $q = mc\Delta t$

$\Delta H = \frac{q}{n}$

$q = 150 \times 4.18 \times 10 =$
$= 6583.5\ J$
$= 6.583\ KJ$



$n = \frac{0.155}{100} = 0.00155$ mol HCl

$\Delta H = \frac{6.5835}{(0.133 \times 10^{-2})} = 4950$

but $= -4950$

b) ΔH_c = reactants − Products

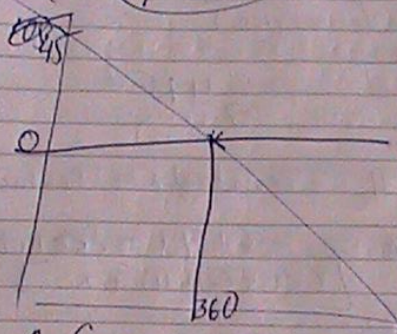
$186 = -6171 - [(2 \times (-1411)) + x]$

$186 = -3349 + x$

$x = -3535$ KJ mole^{-1}

c) positive as 2 mole of gas is produced from 1 mol of gas. (We have 1 mole of gas produced from 1 mole of gas

c(i) Year 13



$\Delta G = \Delta H - T\Delta S$

mimics equation of a straight line

as if we rewrite

$\Delta G = -T\Delta S + \Delta H$

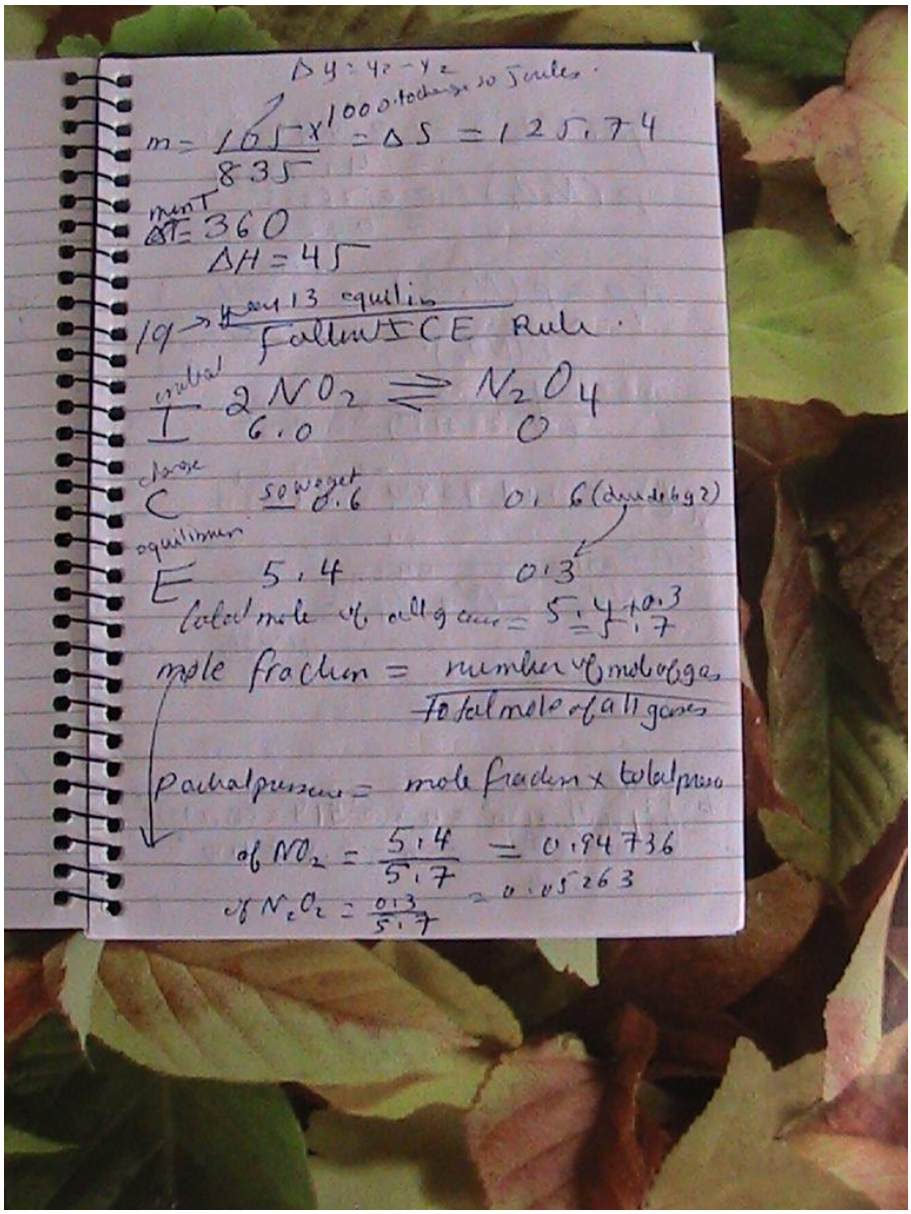
where ΔH is y intercept

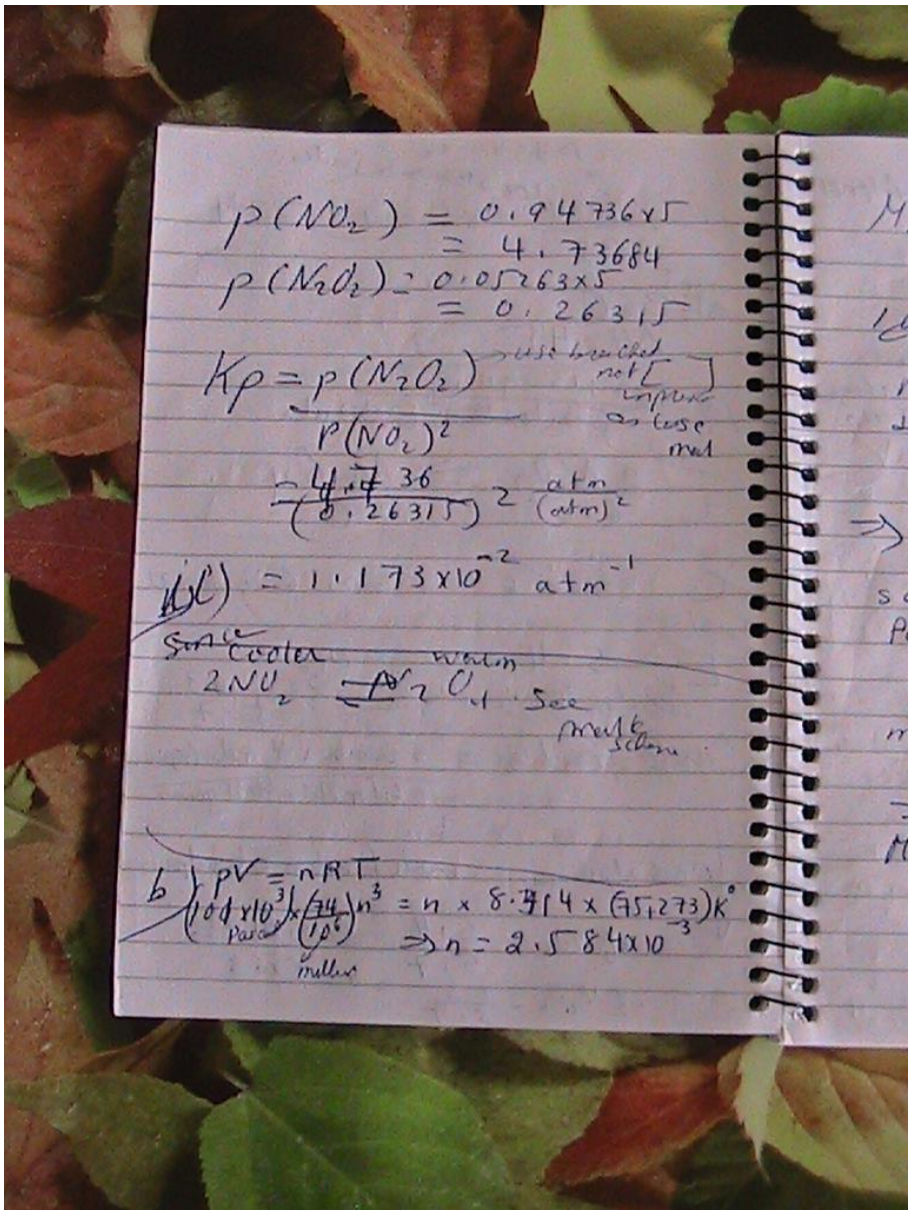
$+\Delta S$ is gradient (m)

$-T$ is x

ΔG is y.

$(y = mx + c)$


ΔS = 42 − 42 = 0 Joules.
m = 161 − x / 835 = ΔS = 125.74
1000 to decrease
ΔT = 360
ΔH = 45
Fallwice Rule.
2NO2 ⇌ N2O4
6.0
5.4
0.3
Total mole of all gases = 5.4 + 0.3 = 5.7
mole fraction = number of moles of gas / Total mole of all gases
Partial pressure = mole fraction × total pressure
of NO2 = 5.4 / 5.7 = 0.94736
of N2O4 = 0.3 / 5.7 = 0.05263



$p(NO_2) = 0.94736 \times 5$
$= 4.73684$
$p(N_2O_2) = 0.05263 \times 5$
$= 0.26315$

$K_p = \dfrac{p(N_2O_2)}{p(NO_2)^2}$ — use brackets not [ ] unless asked

$= \dfrac{0.26315}{4.7736^2} \; \dfrac{atm}{(atm)^2}$

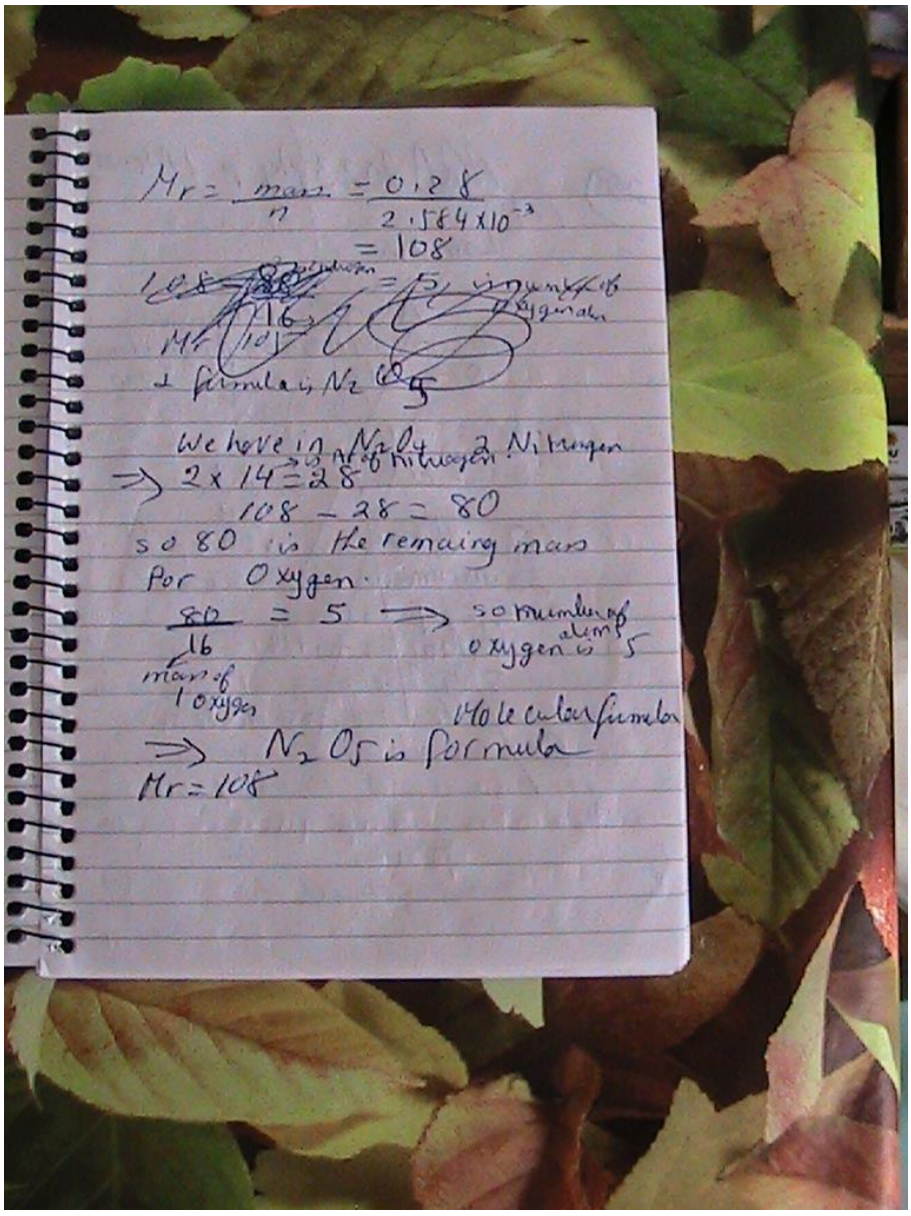
$K(c) = 1.173 \times 10^{-2} \; atm^{-1}$

Cooler
$2NO_2 \rightleftharpoons N_2O_4$ See answer scheme

b) $PV = nRT$

$(101 \times 10^3 \; Pa) \times \left(\frac{34}{10^6}\right) m^3 = n \times 8.314 \times (15+273) K$

$\Rightarrow n = 2.584 \times 10^{-3}$



The rest of the answers will be discussed once you book with me a lesson

Text at 07854144887