Nishant Jindal

(16) $CH_4 \longrightarrow C(g) + 4H(g)$ $\quad 360 = 4\,BE_{C-H}$

$90 = BE_{C-H}$

$C_2H_6 \longrightarrow 2C + 6H(g)$ $\quad BE_{C-C} + 6 \times 90 = 620$

$BE_{C-C} = 80$ kJ/mol

$$\frac{80 \times 10^3}{N_A} J = \frac{hc}{\lambda}$$

(24) $A + BO_2 \longrightarrow AO_2 + B \quad \Delta G < 0$

$A \longrightarrow AO_2 \quad \Delta G \; -1000$

$\longrightarrow BO_2 \longrightarrow B \quad +1200 \; 800$

$HNO_3 + NaOH$

120 mmol 40 mmol

$40 \times 10^{-3} \times 57 \times 10^{3}\ J = 1000 \times 4.2 \times \Delta T$

(29) $|Q| = 20 \times 2\ kJ$

$\Delta H = |Q_m| = \dfrac{40}{2.4/12}$

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Q. for the given chemical Rxn

$$2A(g) + 3B(g) \longrightarrow 4C(g) + 5D(g)$$

then conc of 'C' increases by 8×10^{-3} mol in 20 min in a 10 lit container. find

(i) RoA of C & D

(ii) RoD of A & B

(iii) RoR

in mol/lit/min

$$\frac{\Delta[C]}{\Delta t} = \frac{8\times10^{-3}/10}{20} = 4\times10^{-5} \text{ mol/lit/min}$$

$$RoR = \frac{1}{4}\frac{\Delta[C]}{\Delta t} = 10^{-5}$$

mol/lit/min

RoD of A $= 2\times10^{-5}$

" B $= 3\times10^{-5}$

RoA of C $= 4\times10^{-5}$

D $= 5\times10^{-5}$

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Rate

Average Rate
(defined over a period of time)

$$-\frac{\Delta[A]}{\Delta t}$$

Instantaneous
(defined at a point of time)

$$-\frac{d[A]}{dt}$$

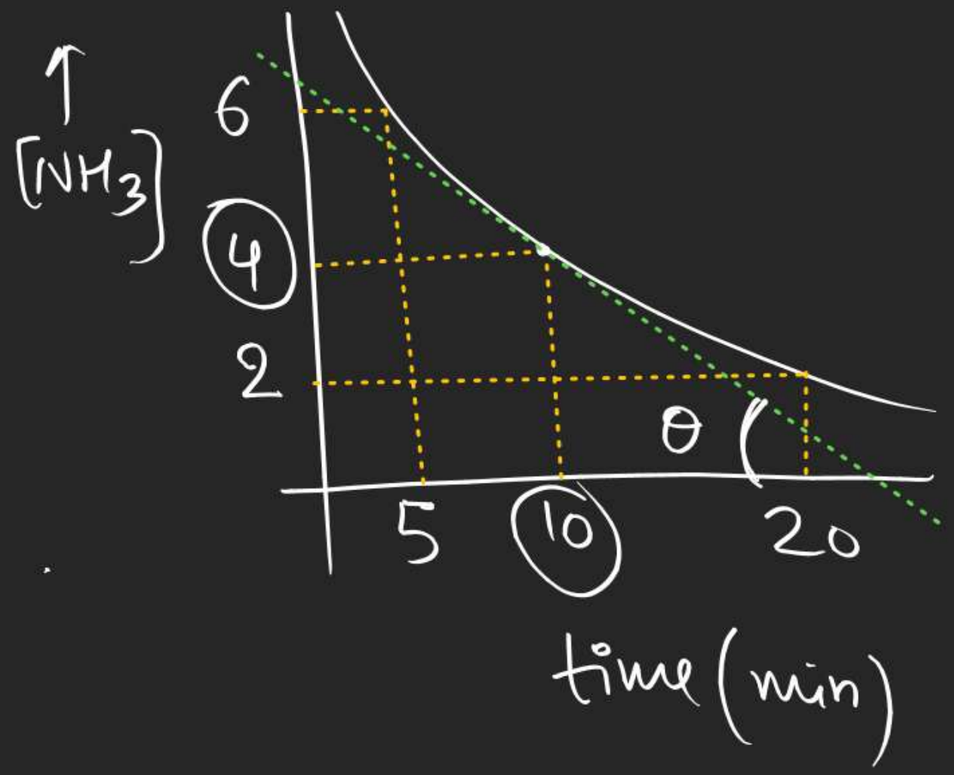
Q find Rate of disappearance of NH_3

from (i) 5 to 10 min $= \frac{2}{5} = 0.4$

(ii) 10 to 20 min $= \frac{2}{10} = 0.2$

$y = e^{-x}$

$\frac{dy}{dx} = -e^{-x}$



(iii) Rate at 10 min

$-\frac{d[NH_3]}{dt}$

tan θ = Ans

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Q. N_2O_5 decomposes into NO_2 and O_2.
Conc of N_2O_5 at any time 't' is given by

$$[N_2O_5]_t = 2e^{-kt}$$

where $k = 10^{-4}\ sec^{-1}$

find
① Conc of N_2O_5 at time 0, 10^4 sec and 2×10^4 sec

2 , $2e^{-10^{-4}\times10^4} = 2/e$, $2/e^2$

② RoD of N_2O_5 from (i) $0-10^4$ sec → $\frac{2-2/e}{10^4}$

(ii) $10^4 - 2\times10^4$ sec → $\frac{2/e-2/e^2}{10^4}$

$\frac{2k}{e}$, $\frac{2}{10^4 e}$, $-\frac{2}{10^4 e}$

③ RoR at 10^4 sec.

$$\left(-\frac{d[N_2O_5]}{dt}\right) = +2ke^{-kt} = \frac{2\times k}{e}$$

$+\frac{1}{10^4 e}$, $\frac{1}{e}$

$$2N_2O_5 \rightarrow 4NO_2 + O_2$$

$$RoR = k/e$$

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physical Chemistry by akk Sir

//t.me/akk7007

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