Agil Arikayyan 3KI

Rate of reaction 2

1 a) $-\frac{1}{2}\frac{d(NO)}{dt} = -\frac{1}{2}\frac{d(H_2)}{dt} = +\frac{d(N_2)}{dt} = +\frac{1}{2}\frac{d(H_2O)}{dt}$

1 b) $+\frac{d(N_2)}{dt} = -\frac{1}{2}\frac{d(NO)}{dt}$

$+2\frac{d(N_2)}{\delta t} = \frac{-\delta(NO)}{\delta t}$

$2(3.4\times10^{-2}\ mol\ dm^{-3}\ s^{-1}) = \frac{-d(NO)}{dt}$

$6.8\times10^{-2}\ mol\ dm^{-3}\ s^{-1} = \frac{d(NO)}{dt}$

1 c) Since

$-\frac{1}{2}\frac{-\partial(H_2)}{\delta t} = \frac{+d(N_2)}{dt}$

the rate of formation of nitrogen gas equals to,

$3.4\times10^{-2}\ mol\ dm^{-3}\ s^{-1}$

$-\frac{1}{2}\frac{-d(H_2)}{dt} = 3.4\times10^{-2}$

$= (-2)\ 3.4\times10^{-2}$

$= -6.8\times10^{-2}$

2) $2.4\times10^{-4} = k(1.0\times10^{-2})$

$k = 2.4\times10^{-2}$

$t\frac{1}{2} = \frac{\ln 2}{k}$

$t\frac{1}{2} = \frac{\ln 2}{2.4\times10^{-2}}$

$t\frac{1}{2} = \cancel{28.9}$ 29s

3) $t\frac{1}{2} = \frac{1}{k(A)_0}$

$t\frac{1}{2} = \frac{1}{(4.0\times10^{-6})(2.0\times10^{-2})}$

$t\frac{1}{2} = 1.25\times10^{7}\ s$

4) $k_1 = Ae^{\frac{-Ea}{RT}}$

$k_1 = (5\times10^{8})^{\frac{-116}{8.314\times25}}$

$k_1 = 1.397\times10^{-5}\ mol\ dm^{-3}\ s^{-1}$

5 a) rate $= k[A]^M$

b) $2NH_3 \rightarrow N_2 + 3H_2$

$\frac{1}{2}$ $\frac{0.67}{.19}$ = rate

rate $= k[A]^M$

$1.763\times10^{-2} = k(0.67)^2$

$k = 3.927\times10^{-2}$

c) $t\frac{1}{2} = \frac{1}{k[A]_0}$

$= \frac{1}{(3.927\times10^{-2})(0.67)}$

$t\frac{1}{2} = 3.8\ s$