

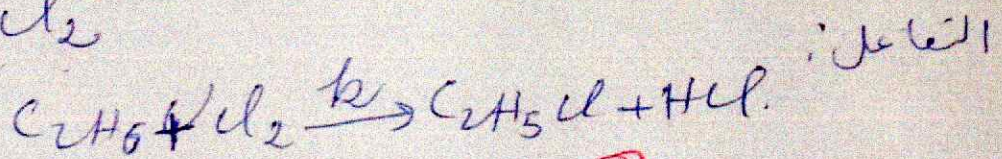
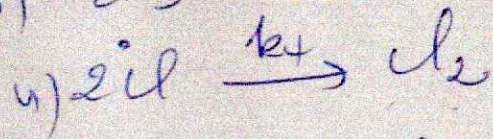
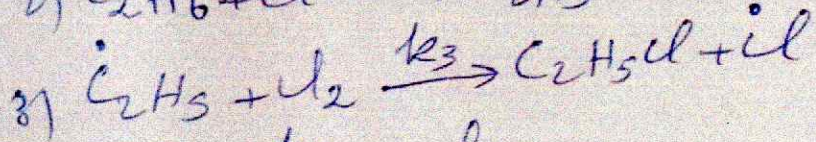
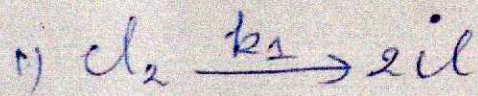
HAFSI Saidchimie analytique/Semestre 2/Cinétique chimique avancée/groupe 1

Matricule	Nom	Prénom	Note
212134009992			13.83
222234039118			
222234048601			10.0
222234049502			17.5
212134003155			14.83
212134009135			18.0
212234093615			15.33
222234067714			19.33
222234006213			13.42
191934001492			
222234065211			19.33
222234052514			13.33
222234067911			13.25
202034000949			
212134008893			15.84
222234005912			11.83
202034005661			
171734005999			

HAFSI Said/chimie analytique/Semestre 2/Cinétique chimique avancée/section 1						
Matricule	Nom	Prénom	Note	Absent	Absence Justifiée	Observation
212134009992			10.0			
222234039118						
222234048601			9.0			
222234049502			11.0			
212134003155			8.5			
212134009135			8.0			
212234093615			0.5			
222234067714			15.25			
222234006213			5.0			
191934001492						
222234065211			10.25			
222234052514			2.5			
222234067911			3.5			
202034000949						
212134008893			2.0			
222234005912			6.5			
202034005661						
171734005999						

حل نموذجي: امتحان في مادة "كيمياء هركية متقدمة"
 الدرجة الأولى ماستر "كيمياء تحليلية"
 2024/2025

المثال الأول (8 نقاط)



معدل التفاعل: $V = -\frac{d[\text{C}_2\text{H}_6]}{dt} = k_2 [\text{C}_2\text{H}_6] [\dot{\text{Cl}}]$ ①

$\frac{d[\dot{\text{Cl}}]}{dt} = 2k_1 [\text{Cl}_2] - k_2 [\text{C}_2\text{H}_6] [\dot{\text{Cl}}] + k_3 [\text{C}_2\text{H}_5\dot{\text{Cl}}] [\text{Cl}_2] - 2k_4 [\dot{\text{Cl}}]^2 = 0$ ①

$\frac{d[\text{C}_2\text{H}_5\dot{\text{Cl}}]}{dt} = k_2 [\text{C}_2\text{H}_6] [\dot{\text{Cl}}] - k_3 [\text{C}_2\text{H}_5\dot{\text{Cl}}] [\text{Cl}_2] = 0$ ①

$[\dot{\text{Cl}}] = \sqrt{\frac{k_1}{k_4}} [\text{Cl}_2]^{1/2}$ ①

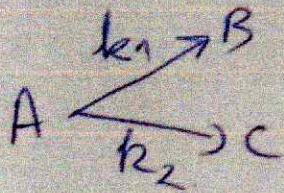
$V = k_2 \sqrt{\frac{k_1}{k_4}} [\text{C}_2\text{H}_6] [\text{Cl}_2]^{1/2}$ $\alpha = 1$ ①,50 $\beta = 1/2$ ①,50

① $k = k_2 \sqrt{\frac{k_1}{k_4}} = 4,2 \times 10^{10} \sqrt{5,3 \times 10^{-23}}$

$k = 0,306 \left(\frac{\text{mol}}{\text{L}} \right)^{-1/2} \cdot \text{s}^{-1}$

①,00

①,00



السؤال الثاني (7 نوا)

تفاعل متوازٍ (2)

$$v = -\frac{d(A)}{dt} = k_1[A] + k_2[A] = (k_1 + k_2) \cdot (A) \quad (0,50)$$

	A	B	C
t = 0	(A) ₀	0	0
t	(A) ₀ - x	y	z

$$x = y + z = [B] + [C] \quad (0,25)$$

$$\int_{(A)_0}^{(A)} \frac{d(A)}{(A)} = -(k_1 + k_2) \int_0^t dt \Rightarrow \ln(A) - \ln(A)_0 = -(k_1 + k_2) \cdot t$$

$$\Rightarrow (A) = (A)_0 e^{-(k_1 + k_2) \cdot t}$$

$$(A) = 0,100 e^{-(2,0 \times 10^{-3} + 1,0 \times 10^{-3}) \times 100} \approx 0,0741 M$$

$$[C] = (A)_0 - x \Rightarrow x = (A)_0 - (A) = 25,9 \times 10^{-3} M$$

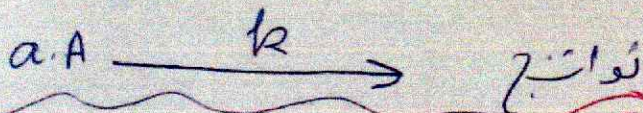
$$\frac{d(B)}{dt} = k_1(A) ; \quad \frac{d(C)}{dt} = k_2(A)$$

$$\frac{d(B)}{d(C)} = \frac{k_1}{k_2} \Rightarrow \frac{(B)}{(C)} = \frac{k_1}{k_2} = \frac{2,0 \times 10^{-3}}{1,0 \times 10^{-3}} = 2,0$$

$$\Rightarrow (C) = 0,50 [B]$$

$$x = (B) + 0,50 [B] = 1,50 [B] \Rightarrow (B) = \frac{x}{1,50}$$

$$[C] \approx 8,60 \cdot 10^{-3} M ; (B) \approx 17,3 \cdot 10^{-3} M$$



$$V = -\frac{1}{a} \frac{d(A)}{dt} = k[A]^n \quad (0,25) \quad (0,50) \quad -1$$

$$-\int_{[A]_0}^{[A]} \frac{d(A)}{[A]^n} = a k \int_0^t dt \Rightarrow \frac{1}{[A]^{n-1}} = \frac{1}{[A]_0^{n-1}} + (n-1) \cdot a \cdot k \cdot t \quad n \neq 1 \quad -2$$

$t = t_{1/2} \Rightarrow (A) = \frac{(A)_0}{2}$

$$\frac{2^{n-1}}{[A]_0^{n-1}} = \frac{1}{[A]_0^{n-1}} + a(n-1) \cdot k \cdot t_{1/2}$$

$$t_{1/2} = \frac{2^{n-1} - 1}{a(n-1) \cdot [A]_0^{n-1} \cdot k} \quad n \neq 1 \quad (1)$$

$n=0$ مباح

$$t_{1/2} = \frac{[A]_0}{2a \cdot k} \quad (1)$$

$n=\frac{1}{2}$ مباح

$$t_{1/2} = \frac{2^{\frac{1}{2}-1} - 1}{a(\frac{1}{2}-1) \cdot [A]_0^{\frac{1}{2}-1} \cdot k}$$

مباح

$$t_{1/2} = \frac{(2 - \sqrt{2}) \sqrt{[A]_0}}{a \cdot k} \quad (1)$$

$n=1$ مباح - 3

$$t_{1/2} = \frac{\ln 2}{a \cdot k} \quad (1)$$