

LAKSHYA (JEE)

Chemical Kinetics

DPP-03

1. Which of the following rate law has an overall order of 0.5 for reaction involving substances x, y and z?

(A) $\text{Rate} = K(C_x)(C_y)(C_z)$

(B) $\text{Rate} = K(C_x)^{0.5}(C_y)^{0.5}(C_z)^{0.5}$

(C) $\text{Rate} = K(C_x)^{1.5}(C_y)^{-1}(C_z)^0$

(D) $\text{Rate} = K(C_x)(C_z)^0(C_y)^2$

2. A chemical reaction involves two reacting species. The rate of reaction is directly proportional to the concentration of one of them and inversely proportional to the concentration of the other. The order of reaction is:

(A) 1

(B) 2

(C) Zero

(D) Unpredictable

3. For the reaction $\text{H}_2(\text{g}) + \text{Br}_2(\text{g}) \rightarrow 2\text{HBr}(\text{g})$, the experimental data suggests, $\text{Rate} = K [\text{H}_2] [\text{Br}_2]^{1/2}$. The order for this reaction is:

(A) 2

(B) $1\frac{1}{2}$

(C) 1

(D) $2\frac{1}{2}$

4. Select the rate law that corresponds to the data shown for the following reaction $\text{A} + \text{B} \rightarrow \text{C}$

Exp.	[A]	[B]	Initial rate
1.	0.012	0.035	0.10
2.	0.024	0.070	1.6
3.	0.024	0.035	0.20
4.	0.012	0.070	0.80

(A) $\text{Rate} = K[\text{B}]^3$

(B) $\text{Rate} = K[\text{B}]^4$

(C) $\text{Rate} = K[\text{A}][\text{B}]^3$

(D) $\text{Rate} = K[\text{A}]^2[\text{B}]^2$

5. In a certain gaseous reaction between X and Y, $\text{X} + 3\text{Y} \rightarrow \text{XY}_3$. The initial rates are reported as follows:

[X]	[Y]	Rate
0.1 M	0.1 M	0.002 Ms^{-1}
0.2 M	0.1 M	0.002 Ms^{-1}
0.3 M	0.2 M	0.008 Ms^{-1}
0.4 M	0.3 M	0.018 Ms^{-1}

(A) $r = K[\text{X}][\text{Y}]^3$

(B) $r = K[\text{X}]^0[\text{Y}]^2$

(C) $r = K[\text{X}][\text{Y}]$

(D) $r = [\text{X}]^0[\text{Y}]^3$

6. Select the law that corresponds to data shown for the following reaction $2A + B \rightarrow C + D$:

Exp.	[A]	[B]	Initial rate (mol L ⁻¹ min ⁻¹)
1.	0.1	0.1	7.5×10^{-3}
2.	0.3	0.2	9.0×10^{-2}
3.	0.3	0.4	3.6×10^{-1}
4.	0.4	0.1	3.0×10^{-2}

(A) Rate = $K[A]^2[B]$

(B) Rate = $K[A][B]^2$

(C) Rate = $K[A][B]^3$

(D) Rate = $K[A][B]$

7. For a hypothetical reaction; $A + B \rightarrow C$ the following data were obtained in three different experiments:

[A] (mol L ⁻¹)	[B] (mol L ⁻¹)	Rate of reaction (mol L ⁻¹ min ⁻¹)
0.01	0.01	1.0×10^{-4}
0.01	0.03	9.0×10^{-4}
0.03	0.03	2.70×10^{-3}

The rate law will be:

(A) $r = K[A]^2[B]$

(B) $r = K[A][B]^2$

(C) $r = K[A][B]$

(D) None of these

8. Calculate the order of the reaction w.r.t. A and B:

[A] (mol L ⁻¹)	[B] (mol L ⁻¹)	Rate
0.05	0.05	1.2×10^{-3}
0.10	0.05	2.4×10^{-3}
0.05	0.10	1.2×10^{-3}

(A) 1 and 0

(B) 1 and 1

(C) 0 and 1

(D) None

9. For a chemical reaction $A + B \rightarrow \text{product}$, the order is one with respect to each A and B. Value of x and y from the given data is:

Rate (mol L ⁻¹ s ⁻¹)	[A]	[B]
0.10	0.20 M	0.05 M
0.40	x	0.05 M
0.80	0.40 M	y

(A) 0.20, 0.80

(B) 0.80, 0.40

(C) 0.80, 0.20

(D) 0.40, 0.20



ANSWERS

1. (C)
2. (C)
3. (B)
4. (C)
5. (B)
6. (B)
7. (B)
8. (A)
9. (C)



Note - If you have any query/issue

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