

Worksheet

Chapter:4 (Chemical Kinetics)

State whether given statement is true or false.

1. The unit of K for first order reaction is $\text{mol L}^{-1} \text{s}^{-1}$. ()
2. The radioactive decay follows zero order kinetics. ()
3. For $r = k[A]^2[B]$, the order of reaction is 3 ()
4. For second order reaction unit of k is $\text{mol}^{-2} \text{L}^2 \text{s}^{-1}$. ()
5. For a reaction order and molecularity are always same. ()
6. Order of reaction is always a whole number whereas molecularity can be fractional. ()

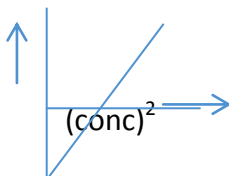
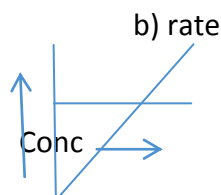
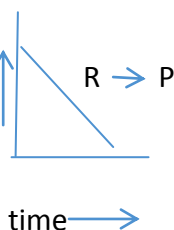
MCQ

1. The order of reaction for, $r = k[A]^2[B]$ is
(a). 1 (b) 0 (c) 2 (d) 3
2. A reaction 50% complete in 2 hours and 75% in 4 hours, the order of reaction will be
(a). 0 (b) 1 (c) 2 (d) 3
3. For a reaction $A + B \longrightarrow C$, the rate law is given by $r = k[A]^{1/2}[B]^2$ the order of reaction is:
(a). 0 (b) 5/2 (c) 2 (d) 3/2
4. What is the unit of K if $\text{rate} = k[A]^2[B]$
(a) s^{-1} (b) mol L^{-1} (c) $\text{mol}^{-2} \text{L}^2 \text{s}^{-1}$ (d) $\text{mol}^{-1} \text{L s}^{-1}$
5. What is the molecularity of reaction for the following elementary reaction:
 $2A + B \longrightarrow C$
(a) 1 (b) 2 (c) 3 (d) 0
6. What is the order for following photochemical reaction:
 $\text{H}_2 + \text{Cl}_2 \longrightarrow 2\text{HCl}$

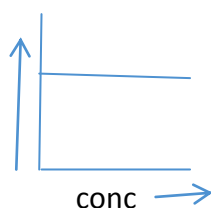
(a) 1 (b) 2 (c) 3 (d) 0

Concept: Order of reaction**Predict the order of reaction for following graphs:**

rate

a) $\log[R]$ 

d) rate

**Concept: Half Life period and relation with rate constant**Fill in the blanks:

- (a). The relationship between $t/2$ and k for first order reaction is _____.
- (b). The half period is independent to concentration of reactants for _____ order reaction.
- (c). The radioactive decay follows _____ order kinetics.
- (d). The rate constant and rate of reaction have same units' for _____ order reaction.
- (e). The half-life period is inversely proportional to concentration of reactants for _____ order reaction.
- (f). If the value of $t/2$ for first order reaction is 693 s, the value of K will be _____.
- (g). The half period is directly proportional to initial concentration of reactants for _____ order reaction.

Answer Key**State whether given statement is true or false.**

- | | |
|--|-------|
| 1. The unit of K for first order reaction is $\text{mol L}^{-1} \text{s}^{-1}$. | (T) |
| 2. The radioactive decay follows zero order kinetics. | (F) |
| 3. For $r = k[A]^2[B]$, the order of reaction is 3. | (T) |
| 4. For second order reaction unit of k is $\text{mol}^{-2} \text{L}^2 \text{s}^{-1}$. | (F) |
| 5. For a reaction order and molecularity are always same. | (F) |
| 6. Order of reaction is always a whole number whereas molecularity can be fractional. | (F) |

MCQ

1. The order of reaction for, $r = k[A]^2[B]$ is

Ans. 3

2. A reaction 50% complete in 2 hours and 75% in 4 hours, the order of reaction will be

Ans. 1

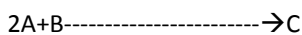
3. For a reaction $A + B \longrightarrow C$, the rate law is given by $r = k[A]^{1/2}[B]^2$ the order of reaction is :

Ans. 5/2

4. What is the unit of K if $\text{rate} = k[A]^2[B]$

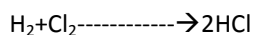
Ans. $\text{mol}^{-2}\text{L}^2\text{s}^{-1}$

5. What is the molecularity of reaction for the following elementary reaction:

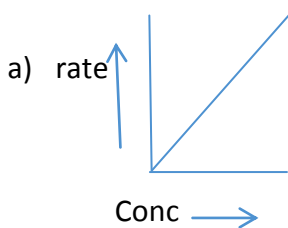


Ans. 3

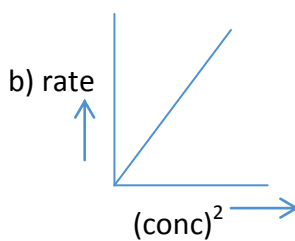
6. What is the order for following photochemical reaction:



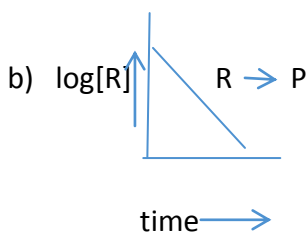
Ans. 0

Concept: Order of reaction**Predict the order of reaction for following graphs:**

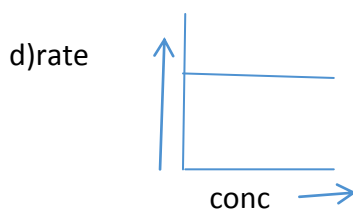
Ans. 1st order



Ans. 2nd order



Ans. 1st order



Ans. Zero order