Parishram (2025)

Physical Chemistry

Chemical Kinetics

Q1 A first order reaction is 50% completed in 1.26×10^{14} s. How much time would it take for 100% completion?
(A) 1.26×10^{15} S
(B) 2.52×10^{14} s
(C) 2.52×10^{28} s
(D) Infinite

Q2 A first order reaction has a specific reaction rate of $10^{-2} \sec^{-1}$. How much time will it take for 20 g of the reactant to reduce to 5 g ?
(A) $138.6 \sec$
(B) $346.5 \sec$
(C) $693.0 \sec$
(D) $238.6 \sec$

Q3 The decomposition of phosphine (PH_3) on tungsten at low pressure is a first order reaction. It is because the
(A) Rate is proportional to the surface coverage
(B) Rate is inversely proportional to the surface coverage
(C) Rate is independent of the surface coverage
(D) Rate of decomposition is very slow.

Q4 The rate of first order reaction is $0.04 \, \text{mol.} \, L^{-1} \, s^{-1}$ at 10 seconds and $0.03 \, \text{mol.} \, L^{-1} \, s^{-1}$ at 20 seconds after initiation of the reaction. The half-life period of the reaction is
(A) 44.1 s
(B) 54.1 s
(C) 24.1 s
(D) 34.1 s

Q5 The rate constant of the reaction $A \to B$ is $0.6 \times 10^{-3} \, \text{molL}^{-1} \, s^{-1}$. If the concentration of

A is $5 \, M$, then concentration of B after 20 minute is
(A) $3.60 \, M$
(B) $0.36 \, M$
(C) $0.72 \, M$
(D) $1.08 \, M$

Q6 When initial concentration of a reactant is doubled in a reaction, its half-life period is not affected. The order of the reaction is
(A) second
(B) more than zero but less than first
(C) zero
(D) first

Q7 A reaction is 50% complete in 2 hours and 75% complete in 4 hours. The order of reaction is
(A) 1 (B) 2
(C) 3 (D) 0

Q8 The half-life of a substance in a certain enzyme catalyzed reaction is 138 s. The time required for the concentration of the substance to fall from $1.28 \, \text{mgL}^{-1}$ to $0.04 \, \text{mgL}^{-1}$ is
(A) 414 s
(B) 552 s
(C) 690 s
(D) 276 s

Q9 If 60% of a first order reaction was completed in 60 minutes, 50% of the same reaction would be completed in approximately $(\log 4 = 0.60, \log 5 = 0.69)$
(A) 45 minutes   (B) 60 minutes
(C) 40 minutes   (D) 50 minutes

Q10 In a first-order reaction $A \to B$, if k is rate constant and initial concentration of the reactant A is $0.5 \, M$, then the half-life is

(A) $\dfrac{\log 2}{k}$

(B) $\dfrac{\log 2}{k\sqrt{0.5}}$

(C) $\dfrac{\ln 2}{k}$

(D) $\dfrac{0.693}{0.5k}$

Answer Key

Q1	(D)		Q6	(D)
Q2	(A)		Q7	(A)
Q3	(A)		Q8	(C)
Q4	(C)		Q9	(A)
Q5	(C)		Q10	(C)

Hints & Solutions

Note: scan the QR code to watch video solution

Q1 Video Solution:

Q6 Video Solution:

Q2 Video Solution:

Q7 Video Solution:

Q3 Video Solution:

Q8 Video Solution:

Q4 Video Solution:

Q9 Video Solution:

Q5 Video Solution:

Q10 Video Solution:

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