Rate law and Rate constant

97. The order of a reaction with rate equals $kC_A^{3/2}C_B^{-1/2}$ is

(a) 2 (b) 1

(c) $-\frac{1}{2}$ (d) $\frac{3}{2}$

98. If the rate expression for a chemical reaction is given by Rate $= k[A]^m[B]^n$

(a) The order of the reaction is m

(b) The order of the reaction is n

(c) The order of the reaction is $m + n$

(d) The order of the reaction is $m - n$

99. The half-life period of a first order reaction is 100 *sec*. The rate constant of the reaction is

(a) $6.93 \times 10^{-3}\ sec^{-1}$

(b) $6.93 \times 10^{-4}\ sec^{-1}$

(c) $0.693\ sec^{-1}$

(d) $69.3\ sec^{-1}$

100. For the first order reaction with rate constant k, which expression gives the half-life period? (Initial concentration $= a$)

(a) $\frac{1^2}{k}$ (b) $\frac{1}{ka}$

(c) $\frac{0.693}{k}$ (d) $\frac{3}{2ka^2}$

101. The rate constant of a first order reaction whose half-life is 480 seconds, is

(a) $2.88 \times 10^{-3}\ sec^{-1}$

(b) $1.44 \times 10^{-3}\ sec^{-1}$

(c) $1.44\ sec^{-1}$

(d) $0.72 \times 10^{-3}\ sec^{-1}$

102. The conversion of $A \rightarrow B$ follows second order kinetics. Doubling the concentration of A will increase the rate of formation of B by a factor

(a) $1/4$ (b) 2

(c) $1/2$ (d) 4

103. The reaction $2FeCl_3 + SnCl_2 \rightarrow 2FeCl_2 + SnCl_4$ is an example of

(a) First order reaction

(b) Second order reaction

(c) Third order reaction

(d) None of these

104. If reaction between A and B to give C shows first order kinetics in A and second order in B, the rate equation can be written as

(a) Rate $= k[A][B]^{1/2}$

(b) Rate $= k[A]^{1/2}[B]$

(c) Rate $= k[A][B]^2$

(d) Rate $= k[A]^2[B]$

105. For a first order reaction, the half-life period is independent of

(a) Initial concentration
(b) Cube root of initial concentration
(c) First power of final concentration
(d) Square root of final concentration

106. Order of a reaction can have
(a) $+ve$ values
(b) Whole number values
(c) Fractional values
(d) All of the above

107. The order of the reaction occurring by following mechanism should be
(i) $A_2 \rightarrow A + A$ (fast)
(ii) $A + B_2 \rightarrow AB + B$ (slow)
(iii) $A + B \rightarrow$(fast)
(a) $1\frac{1}{2}$
(b) $3\frac{1}{2}$
(c) 2
(d) None of these

108. For the reaction $A \rightarrow B$, the rate law expression is : Rate $= k[A]$
Which of the following statements is incorrect
(a) The reaction is said to follow first order kinetics
(b) The half life of the reaction will depend on the initial concentration of the reactant
(c) $k$is constant for the reaction at a constant temperature
(d) The rate law provides a simple way of predicting the concentration of reactants and products at any time after the start of the reaction

109. If initial concentration is reduced to its 1/4th in a zero order reaction, the time taken for half of the reaction to complete
(a) Remains same
(b) Becomes 4 times
(c) Becomes one-fourth
(d) Doubles

110. For a reaction whose rate expression is :
Rate $= k[A]^{1/2}[B]^{3/2}$, the order would be
(a) 1.5 (b) 2
(c) 3 (d) 1

111. For the reaction $A \rightarrow B$, the rate increases by a factor of 2.25 when the concentration of A is increased by 1.5. What is the order of the reaction
(a) 3 (b) 0
(c) 2 (d) 1

112. For the reaction $H_2 + Cl_2 \xrightarrow{\text{Sunlight}} 2HCl$ taking place on water, the order of reaction is

(a) 1 (b) 2

(c) 3 (d) 0

113. For a first order reaction, rate constant is $0.6932hr^{-1}$, then half-life for the reaction is

(a) $0.01hr$ (b) $1hr$

(c) $2hr$ (d) $10hr$

(e) $0.1hr$

114. The rate constant of a reaction is $0.69 \times 10^{-1}\, min^{-1}$ and the initial concentration is $0.2moll^{-1}$. The half-life period is

(a) 400 *sec* (b) 600 *sec*

(c) 800 *sec* (d) 1200 *sec*

115. The rate constant of a first order reaction is 3×10^{-6}per second. If the initial concentration is 0.10 *m*, the initial rate of reaction is

(a) $3 \times 10^{-5} ms^{-1}$

(b) $3 \times 10^{-6} ms^{-1}$

(c) $3 \times 10^{-8} ms^{-1}$

(d) $3 \times 10^{-7} ms^{-1}$

116. Certain bimolecular reactions which follow the first order kinetics are called

(a) First order reactions

(b) Unimolecular reactions

(c) Bimolecular reactions

(d) Pseudounimolecular reactions

117. The rate law of the reaction $A + 2B \rightarrow$Product is given by $\frac{d[dB]}{dt} = k[B^2]$.

If A is taken in excess, the order of the reaction will be

(a) 1 (b) 2

(c) 3 (d) 0

118. For a first order reaction $A \rightarrow$product, the rate of reaction at $[A] = 0.2moll^{-1}$ is $1.0 \times 10^{-2} moll^{-1}\, min^{-1}$. The half life period for the reaction is

(a) 832 *s* (b) 440 *s*

(c) 416 *s* (d) 13.86 *s*