Rate law and Rate constant

144. 75% of a first order reaction was completed in 32 minutes when was 50% of the reaction completed

(a) 16 *min.* (b) 24 *min.*

(c) 8 *min.* (d) 4 *min.*

145. The decomposition of N_2O_5 occurs as, $2N_2O_5 \rightarrow 4NO_2 + O_2$, and follows I[st] order kinetics, hence

(a) The reaction is unimolecular

(b) The reaction is bimolecular

(c) $T_{1/2} \propto a^0$

(d) None of these

146. Which equation is correct for first order reactions

(a) $t_{1/2} \propto C^{-1}$ (b) $t_{1/2} \propto C$

(c) $t_{1/2} \propto C^0$ (d) $t_{1/2} \propto C^{1/2}$

147. For the reaction system $2NO(g) + O_2(g) \rightarrow 2NO_2(g)$ volume is suddenly produced to half its value by increasing the pressure on it. If the reaction is of first order with respect to O_2 and second order with respect to NO, the rate of reaction will

(a) Diminish to one fourth of its initial value

(b) Diminish to one eighth of its initial value

(c) Increase to eight times of its initial value

(d) Increase to four times of its initial value

148. If the rate of the reaction is equal to the rate constant, the order of the reaction is

(a) 3 (b) 0

(c) 1 (d) 2

149. The reaction $A \rightarrow B$ follows first order kinetics. The time taken for 0.8 mole of *A* to produce 0.6 mole of *B* is 1 *hour*. What is the time taken for conversion of 0.9 mole of *A* to produce 0.675 mole of *B*

(a) 2 *hours* (b) 1 *hour*

(c) 0.5 *hour* (d) 0.25 *hour*

150. The unit of velocity constant in case of zero order reaction is

(a) Concentration× Time^{-1}

(b) Concentration^{-1} × Time^{-1}

(c) Concentration × Time^2

(d) Concentration^{-1} × Time

151. Which one of the following is wrongly matched

(a) Saponification of $CH_3COOC_2H_5$ – Second order reaction

(b) Hydrolysis of CH_3COOCH_3 – Pseudo uni-molecular reaction

(c) Decomposition of H_2O_2 – First order reaction

(d) Combination of $H_2$and Br_2 to give HBr – Zero order reaction

152. Which of the following is an example of pseudo unimolecular reaction

(a) $CH_3COOCH_3 + H_2O \xrightarrow{H^+} CH_3COOH + CH_3OH$

(b) $CH_3COOCH_3 + H_2O \xrightarrow{OH^-} CH_3COOH + CH_3OH$

(c) $2FeCl_3 + SnCl_2 \rightarrow SnCl_4 + 2FeCl_2$

(d) $NaOH + HCl \rightarrow NaCl + H_2O$

153. Hydrolysis of DDT is a first order reaction, its half life is 10 years. Time to hydrolyse 10 *g* DDT to half is

(a) 100 years (b) 50 years

(c) 5 years (d) 10 years

154. In a first order reaction, the concentration of the reactant, decreases from 0.8 *M* to 0.4 *M* in 15 minutes. The time taken for the concentration to change from 0.1 *M* to 0.025 *M* is

(a) 7.5 minutes (b) 15 minutes

(c) 30 minutes (d) 60 minutes

155. In the first order reaction, the concentration of the reactant is reduced to 25% in one hour. The half life period of the reaction is

(a) 2 *hr* (b) 4 *hr*

(c) 1/2 *hr* (d) 1/4 *hr*

156. For a reaction, $X(g) \rightarrow Y(g) + Z(g)$ the half life period is 10 min. In What period of time would the concentration of *X* be reduced to 10% of original concentration

(a) 20 *min* (b) 33 *min*

(c) 15 *min* (d) 25 *min*

157. A first order reaction with respect to the reactant *A* has a rate constant of $6\ sec^{-1}$. If we start with [*A*] = 0.5 mol/litre, then in what time the concentration of *A* becomes 0.05 mol/litre

(a) 0.384 *sec* (b) 0.214 *sec*

(c) 3.84 *sec* (d) 0.402 *sec*

158. Order of radioactive disintegration reaction is

(a) Zero (b) First

(c) Second (d) Third

159. The rate of a first order reaction is $1.5 \times 10^{-2}\ molL^{-1}\ min^{-1}$ at 0.5 *M* concentration of the reactant. The half life of the reaction is

(a) 8.73 *min* (b) 7.53 *min*
(c) 0.383 *min* (d) 23.1 *min*

160. A first order reaction was started with a decimolar solution of the reactant, 8 minutes and 20 seconds later its concentration was found to be $M/100$. So the rate of the reaction is
(a) $2.303 \times 10^{-5}\ sec^{-1}$
(b) $2.303 \times 10^{-4}\ sec^{-1}$
(c) $4.606 \times 10^{-3}\ sec^{-1}$
(d) $2.606 \times 10^{-5}\ sec^{-1}$
(e) $2.603 \times 10^{-4}\ sec^{-1}$

161. Which is correct about zero order reaction
(a) Rate of reaction depends on decay constant
(b) Rate of reaction is independent of concentration
(c) Unit of rate constant is concentration^{-1}
(d) Unit of rate constant is concentration^{-1} time^{-1}

162. Decay of $92U^{235}$is .....order reaction
(a) Zero (b) First
(c) Second (d) Third

163. The half-life of 2 sample are 0.1 and 0.4 seconds. Their respective concentration are 200 and 50 respectively. What is the order of the reaction
(a) 0 (b) 2
(c) 1 (d) 4

164. The following statements(s) is(are) correct
(a) A plot of $log\ K_p$ *versus* $1/T$ is linear
(b) A plot of $log[X]$ *versus* time is linear for a first order reaction $X \rightarrow P$
(c) A plot of $log\ P$ *versus* $1/T$ is linear at constant volume
(d) A plot of P *versus* $1/V$ is linear at constant temperature

165. For a first order reaction
(a) The degree of dissociation is equal to $(1 - e^{-kt})$
(b) A plot of reciprocal concentration of the reactant *vs* time gives a straight line
(c) The time taken for the completion of 75% reaction is thrice the $t_{1/2}$ of the reaction
(d) The pre-exponential factor in the Arrhenius equation has the dimension of time T^{-1}

166. For reaction a $A \rightarrow x\ P$, when $[A] = 2.2\ mM$, the rate was found to be $2.4\ mM\ s^{-1}$. On reducing

concentration of *A* to half, the rate changes to $0.6\ mM\ s^{-1}$. The order of reaction with respect to *A* is

(a) 1.5 (b) 2.0

(c) 2.5 (d) 3.0

167. Which one of the following statement for order of reaction is not correct

(a) Order can be determined experimentally.

(b) Order of reaction is equal to sum of the powers of concentration terms in differential rate law.

(c) It is not affected with the stoichiometric coefficient of the reactants.

(d) Order cannot be fractional.

168. $t_{\frac{1}{4}}$ can be taken as the time taken for the concentration of a reactant to drop to $\frac{3}{4}$ of its initial value. If the rate constant for a first order reaction is K, the $t_{\frac{1}{4}}$ can be written as

(a) $0.10/K$ (b) $0.29/K$

(c) $0.69/K$ (d) $0.75/K$

169. For a first order reaction $A \rightarrow B$ the reaction rate at reactant concentration of $0.01M$ is found to be $2.0 \times 10^{-5} mol\ L^{-1}s^{1}$. The half life period of the reaction is

(a) 220 *s* (b) 30 *s*

(c) 300 *s* (d) 347 *s*

170. The rate of reaction between two reactants *A* and *B* decreases by a factor of 4 if the concentration of reactant B is doubled. The order of this reaction with respect to reactant *B* is

(a) – 1 (b) – 2

(c) 1 (d) 2

171. If a substance with half life 3 days is taken at other place in 12 days. What amount of substance is left now

(a) 1/4 (b) 1/8

(c) 1/16 (d) 1/32

172. The half-life of a first order reaction having rate constant $K = 1.7 \times 10^{-5}\ s^{-1}$ is

(a) 12.1 *h* (b) 9.7 *h*

(c) 11.3 *h* (d) 1.8 *h*

173. For the reaction $A + B \rightarrow C$, it is found that doubling the concentration of *A* increases the rate by 4 times, and doubling the concentration of *B* doubles the reaction rate. What is the overal order of the reaction.

(a) 4 (b) 3/2

(c) 3 (d) 1

174. Which of the following reactions end in finite time

(a) 0 order (b) 1st order

(c) 2nd order (d) 3rd order