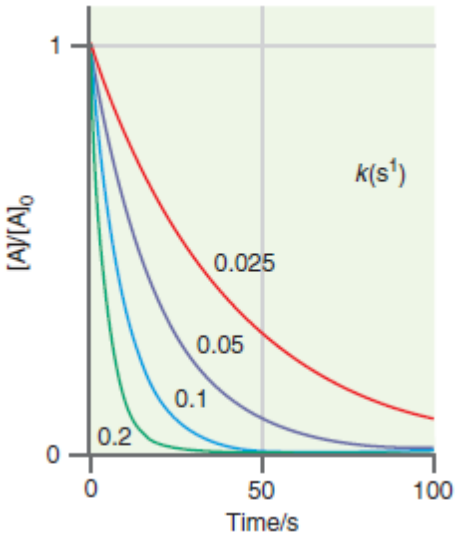
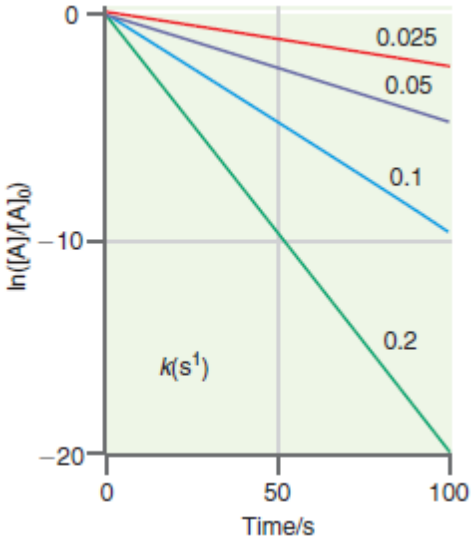
Answers

Tutorial -1 (Chemical Kinetics)

1. Number of disintegrations per second = 3.66×10^{10}
2. Order of the reaction = 2
3. Concentration of 'A' and 'B' after 2 minutes = 0.0294 M
   Initial rate= 2×10^{-3} Ms^{-1}
   Rate after 2 minutes= 1.79×10^{-4} Ms^{-1}
4. $\frac{t_{1/2}}{t_{3/4}} = \frac{2^{n-1}-1}{4^{n-1}-1}$
5.





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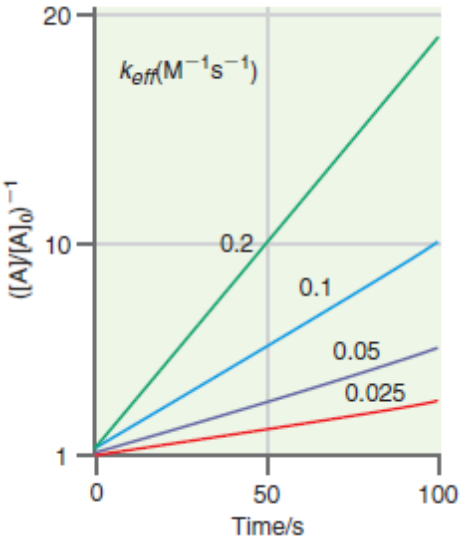

7. 1^{st} order reaction. k= 0.35 min^{-1}
   Half life= 1.98 min
8. Rate constant= $3x10^{-3}$ min
9. Rate constant = 7.08 x 10^{-3} $M^{-1}s^{-1}$
   $t_{1/2}$ of 'A' = 2173 s, $t_{1/2}$ of 'B' = 3151 s
10. Integrated rate law for A+2B→P

$$\frac{1}{[B]_0 - 2[A]_0} \ln \frac{[A]_0[B]}{[A][B]_0} = kt$$

11. Rate constant= 3.47 x $10^{-3}M^{-1}s^{-1}$
12. $t_{1/2}$ of 'A' =8560 s, $t_{1/2}$ of 'B' = 1576 s