Sapnafuples -

Kinetics (4) Rate and Time Dependence - 2nd order

(1) * The rate constant for a 2nd order reaction $2NO_2 \longrightarrow 2NO + O_2$ is $0.54/M$ at 300°C. How long in seconds will it take the conc. of NO_2 to decrease from 0.65M to 0.18 M?

Ans

$$\frac{1}{[A]} = \frac{1}{[A]_0} + kt \quad *$$

$$\frac{1}{0.18M} = \frac{1}{0.65M} + 0.54/M\,(t)$$

$$t = 7.4s$$

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(2) * In a 2nd order reaction: A ⟶ products, What is the conc. of [A] after 55 sec. if the initial conc. is 0.80 M. $k = 0.023/Ms$

Ans

$$\frac{1}{[A]_t} = \frac{1}{[A]_0} + kt$$

$$\frac{1}{[A]_t} = \frac{1}{0.80M} + (0.023/Ms)(55s)$$

$$= 1.25 + 1.265$$

$$\frac{1}{[A]_t} = 2.515.$$

$$[A]_t = 0.40M$$

Sapna Gupta --

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