

The decomposition of a compound takes 10 hours to complete and is second order. If the final concentration is 0.02 M and the rate is 1.8, what are the initial concentration and the half life for the reaction.

**Solutin:**

1. Order of the reaction is second, so we can schematically represent our reaction as  $A + B \rightarrow P$  and assume that initial concentrations were the same.
2. Now we found the initial concentration by this formula:

$$-\frac{1}{[A]_0 - [A]} = k t$$

3. And the half life for the reaction:

$$t_{1/2} = \frac{1}{k[A]_0}$$

**Answer:**  $M, \frac{1}{2}$

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