Answer on Question #78557 - Chemistry - Physical Chemistry

Question: A reaction is catalyzed by an enzyme with parameters k=103 s-1, KM=61·10-6 M and concentration [E]0= 3.5·10-6 M. The initial concentration of the substrate is [S]0= 3.6·10-5 M. Estimate initial reaction rate. Find the substrate's concentration providing 2-fold decreasing of the reaction rate.

Solution:

$$v_0 = \frac{k \cdot [E]_0 \cdot [S]_0}{[S]_0 + K_m};$$

v_0 = 103·3.5·10^{-6}·3.6·10^{-5}/(3.6·10^{-5} + 61·10^{-6}) =1.3·10^{-8}/9.7·10^{-5} = 1.3·10^{-4} M/s.

Answer: 1.3·10^{-4} M/s.