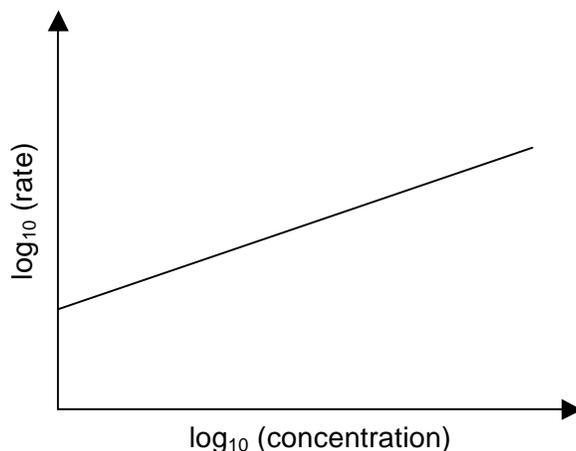


Self-Assessment: Reactions & Kinetics

Weekly Homework Quiz

Problem #1

1. Urbium (Ur) is an upscale element found in big cities. Its oxide (UrO_2) is not very stable and decomposes readily at temperatures exceeding 666°C . The figure below shows how the rate of reaction varies with the concentration of UrO_2 at 777°C . The rate, r , is in units of M/s and the concentration of UrO_2 , c , is in units of M (mole/L). The slope has a value of 1.77 and the intercept has a value of 1.46.



- (a) What is the order of reaction?
 - (b) Calculate the value of the rate constant. Pay strict attention to the units.
 - (c) On the graph above, draw the line showing how the rate of reaction varies with the concentration of UrO_2 at 888°C . No calculation necessary. Pay attention to relative values and slopes.
2. Show by a calculation that the diffusion length of boron (B) in germanium (Ge) is less than $1.0\ \mu\text{m}$ at a temperature of $1200\ \text{K}$ for a diffusion time of 30 minutes. The diffusion coefficient of B in Ge at $1200\ \text{K}$, D_{B} , has the value of $2.0 \times 10^{-17}\ \text{m}^2/\text{s}$.

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