

# Quiz 1 Error Analysis

Incorrect Questions: 4, 5, 6

- ④ I accidentally confused the symbol for time ( $t$ ) with temperature ( $T$ ), thus leading to part A: B answers to be wrong. Since I do know the difference between the two, looking forward I will be more mindful of making small mistakes like this one.

$$a) \ln(.289M) = -k(20 \text{ min}) + \ln(.400M)$$

$$\Rightarrow \ln\left(\frac{.289M}{.400M}\right) = -k(20 \text{ min})$$

$$\Rightarrow -.325 = -k(20 \text{ min})$$

$$\Rightarrow \frac{-.325}{-20 \text{ min}} = k$$

$$\Rightarrow k = .01625 \text{ min}^{-1}$$

$$b) \ln(.35M) = -(0.01625 \text{ min}^{-1})(t) + \ln(.400M)$$

$$\Rightarrow \ln\left(\frac{.35M}{.4M}\right) = -(0.01625 \text{ min}^{-1})(t)$$

$$\Rightarrow -.1335 = -(0.01625 \text{ min}^{-1})(t)$$

$$\Rightarrow t = \frac{-.1335}{-.01625 \text{ min}^{-1}}$$

$$\Rightarrow t = 8.2 \text{ min}$$

- ⑤ I likely plugged the equation into the calculator inaccurately. Looking forward I will be more careful on how I plug in equations into the calculator.

$$\Rightarrow \ln(5 \times 10^{-19}) = \frac{-E_a}{(6843.67)}$$

$$\Rightarrow \ln(5 \times 10^{-19}) \cdot (-6843.67) = E_a$$

$$\Rightarrow E_a = 288392 \text{ J/mol}$$

⑥

a) I wasn't sure about the effects of increasing concentrations. Looking forward I will try to understand and practice more on topics I'm unfamiliar with.

⇒ The concentration of a half life is based on rate constant and not concentration so there would be no change.

b) I got the first half of my response correct however I mistakenly wrote that the half life would increase instead of decrease. Looking forward, I will try to reread my responses more carefully.

⇒ Increasing the temperature will cause the reaction rate to speed up. As a result, the half life would be shorter.