

Chapter 13 Study Guide

Pg. 264 #13 Correction

The answer given in the back of the study guide is incorrect. I believe that the authors used an incorrect T_2 in their calculation (using $T_2 = 310^\circ\text{C}$ comes very close). Your solution should be:

$$\ln\left(\frac{k_{573\text{ K}}}{4.60 \times 10^{-4} \text{ s}^{-1}}\right) = -\frac{100,000 \text{ J/mol}}{8.315 \text{ J/mol} \cdot \text{K}} \left(\frac{1}{573 \text{ K}} - \frac{1}{523 \text{ K}}\right) = 2.007$$

$$\frac{k_{573\text{ K}}}{4.60 \times 10^{-4} \text{ s}^{-1}} = e^{2.007} = 7.44$$

$$k_{573\text{ K}} = (7.44)(4.60 \times 10^{-4} \text{ s}^{-1}) = \boxed{3.42 \times 10^{-3} \text{ s}^{-1}}$$