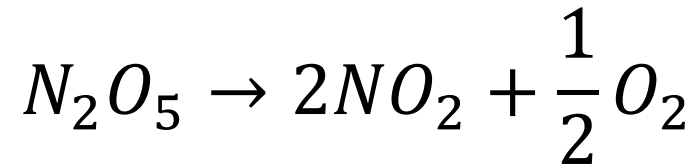


Activation energy

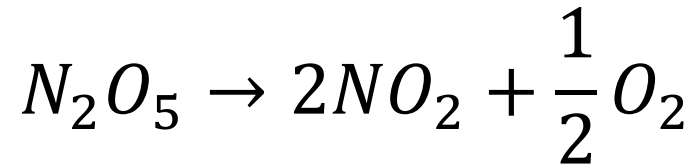
Calculate the activation energy for the reaction



given that the specific rate constants for the decomposition are 0.430 s^{-1} at 300 K and 697 s^{-1} at 500 K.

Activation energy

Calculate the activation energy for the reaction



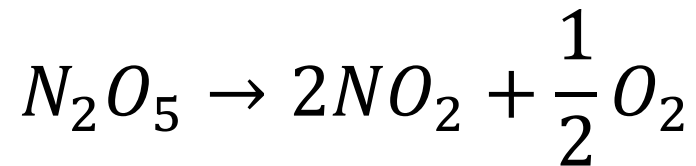
given that the specific rate constants for the decomposition are 0.430 s^{-1} at 300 K and 697 s^{-1} at 500 K.

Solution: Use the equation

$$E_a = \frac{-R \ln \frac{k_2}{k_1}}{\left(\frac{1}{T_2} - \frac{1}{T_1}\right)}$$

Activation energy

Calculate the activation energy for the reaction



given that the specific rate constants for the decomposition are 0.430 s^{-1} at 300 K and 697 s^{-1} at 500 K.

Solution: Use the equation

$$E_a = \frac{-8.31 \ln \frac{697}{0.430}}{\left(\frac{1}{500} - \frac{1}{300}\right)} = 46,000 \text{ J/mol}$$