**Determination of Activation Energy using two data points:**

Determine the activation energy (Ea) using the k = 0.77 M–1s–1 at 330oC and k = 4.7 M–1s–1 at 383oC.

ln (k2 ) = –Ea ( 1

– 1 )

ln (

k1 R

4.7 ) =

T2 T1

–Ea

( 1 – 1 )

0.77

8.314 J / mol • K

656K

603K

1.808927=

–Ea

8.314 J / mol • K

(–1.3398 x 10–4K–1)

E = (1.808927)(8.314 J / mol) =1.1225 x 105J /mol 1.3398 x 10–4

a

Ea =112 kJ / mole

Practice:

1. Determine the activation energy (Ea) using the k = 0.500 M–1s–1 at 92.0oC and k = .750 M–1s–1 at 100.oC.
2. Determine the Temperature with k = 0.500 M–1s–1 using Ea= 57.4 KJ/mol and k = .750 M–1s–1 at 100.oC.
3. Determine the rate constant at 92.0oC using Ea= 57.4 KJ/mol and k = .750 M–1s–1 at 100.oC.