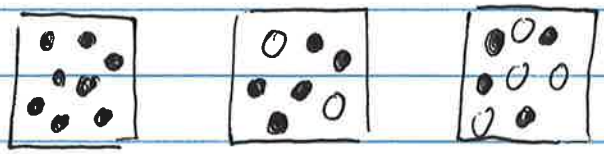
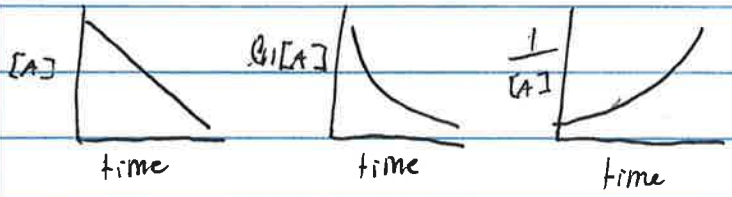
Today: Feb 1st. Finish ch 13 topics for Ch1
Sunday: Problem club with Ali 6-7:30 eply 107
Monday: Review and rest of ch 13 not on Ch1
Tuesday: Kinetics lab (expt 8)
Tuesday evening: Problem club with Ali 6-7:30 eply 107
Wednesday: Celebration of Knowledge #1



time	[A]
0	8
1	6
2	4



1) What is the order and rate law?

rate = k zero order

2) What is the rate constant, k, with units?

time-conc expression $[A]_t = -kt + [A]_0$

$4 = -k(2\,min)(8)$

$-4 = -k(2\,min)$

$k = 2\ mol/L \cdot min$

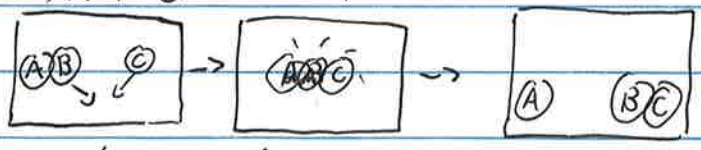
3) sketch situation when $t = 3\,min$

$[A]_t = -kt + [A]_0$

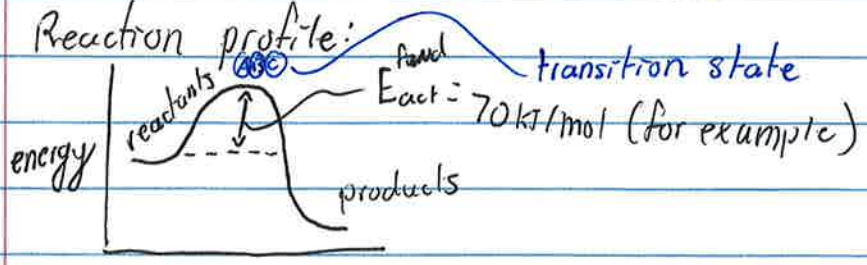
$[A]_t = -(2\ mol/L \cdot min)(3\,min) + 8\ mol/L$

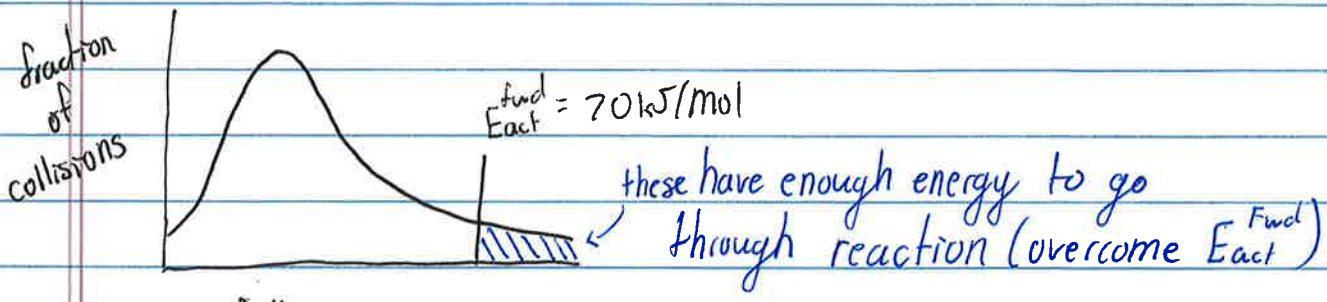
$[A]_t = 2\ mol/L$

$AB + C \longrightarrow A + BC$



Reaction profile:





has to be J

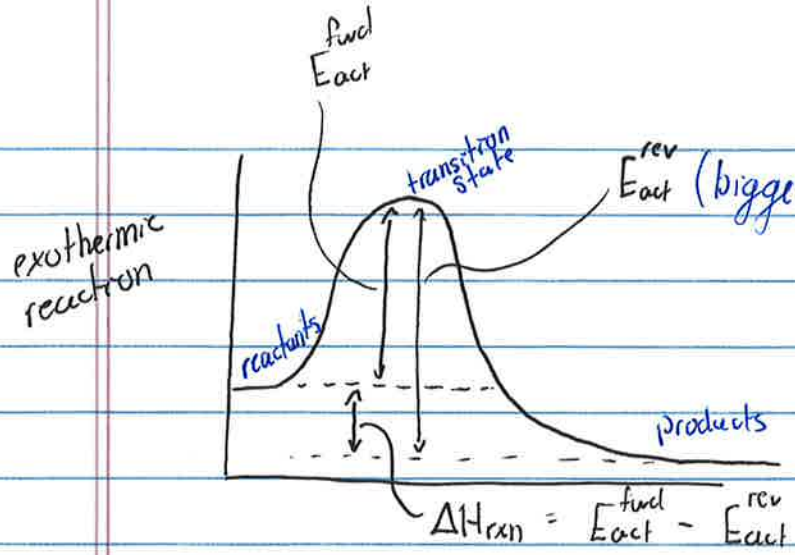
$$\text{fraction} = e^{-E_{act}/RT}$$

$$\text{fraction} = e^{\frac{-70000\,J\,|\,mol\cdot k\,|}{8.314\,J\,|\,300k\,|}}$$

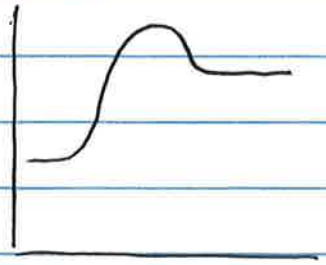
$$\text{fraction} = e^{-28.07} = 6.5 \times 10^{-13}$$ (very few have enough energy)

- Raising the temperature will increase the number of molecules that can overcome E_{act}^{fwd}

- orientation of molecules and frequency of collisions also matters for overcoming E_{act}^{fwd}



endothermic reaction:



Mechanism (can be more than one step)

Step 1. $AB + C \rightarrow A + BC$

·from the slow step, we can write a rate expression that features the reactant(s) in the rate expression:

rate = $k[AB][C]$

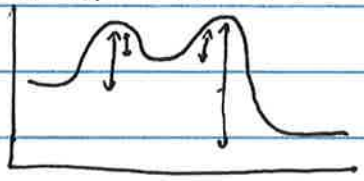
·When you have more than one step, sometimes you get intermediates (made in one step and used up in the next)

example:

step 1. $NO_2 + NO_2 \rightarrow NO + NO_3$ (slow)

step 2. $NO_3 + CO \rightarrow NO_2 + CO_2$ (fast) ← lower E_{act}^{fwd}

overall: $NO_2 + CO \rightarrow NO_2 + CO_2$



number of steps = number of hills

overall exothermic