

Rate Affecting Factors

Collision theory

Reactants must collide in order to react

You need “effective collisions”

Activation energy

Minimum amount of energy colliding particles need in order to react.

Fast Enough AND Correct Orientation

Factors of Reaction Rate

1. Temperature
2. Concentration
3. Surface area
4. Catalysts

Increase any of these, you get more effective collisions...so it goes faster!



Temperature

- Higher temperature**
= Higher kinetic energy
- = More likely to get over
the activation curve
- = faster rate

Concentration

Higher Concentration

= More particles

= More chances of proper collisions

= Faster rate

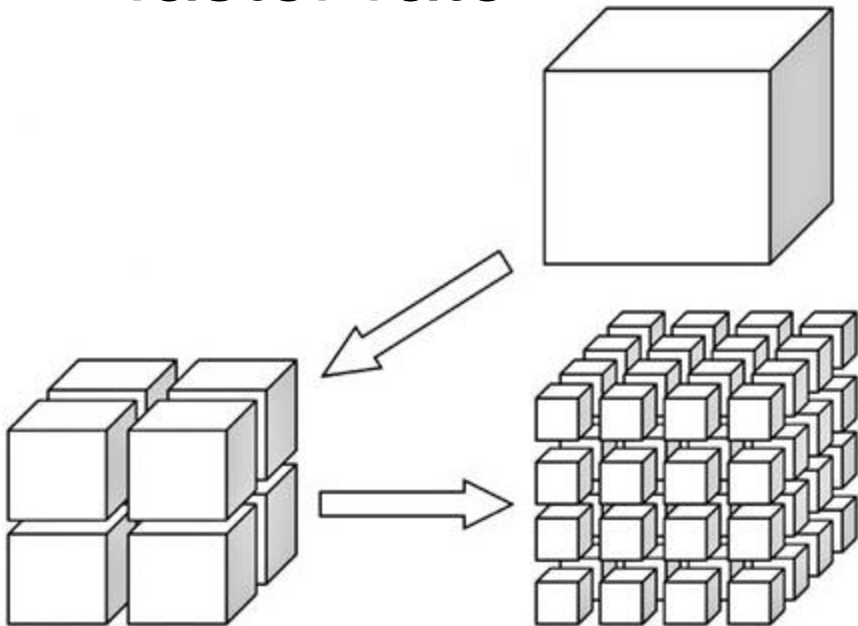
TO A POINT!!!



Surface Area

More Surface Area

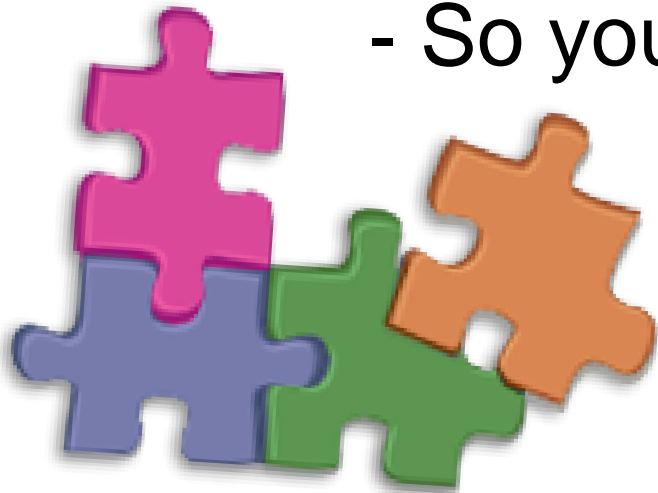
- = More access to chemicals
- = more collisions
- = faster rate



Catalysts

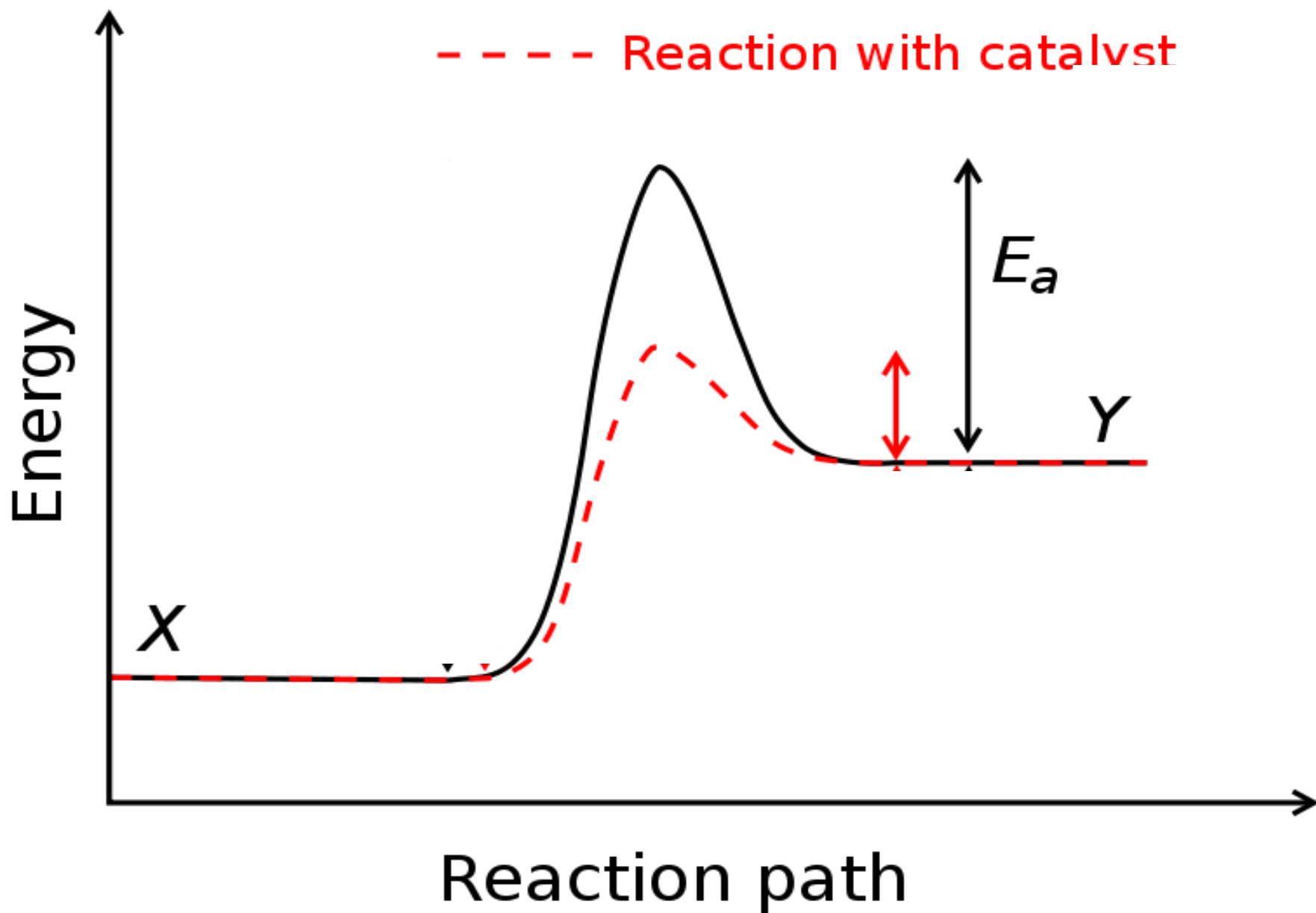
What is it?

- A chemical that you add to reaction
- Does NOT get used up during reaction
- Helps orient molecules to reach transition state easier
- So you do not need as much energy
- **Lowers Activation Energy**
= faster reaction



— Reaction without catalyst

- - - Reaction with catalyst



| Changes # of Collisions | Changes Activation Energy |
|--------------------------------|----------------------------------|
| | |



BECAUSE it changes the # of EFFECTIVE collisions