## Most Missed Monday!

1. Kinetic energy is directly proportional to… temp.
2. What is the volume at STP given .875 moles?
3. How can you decrease entropy? 273K, 1atm, less parts, ↓ temp., ↓ space
4. Which substances dissolve in water? Polar covalent, ionic
5. Adding solute does what to boiling point and what to freezing point? ↓, ↑
6. How can you increase the solubility of a gas? ↓ temp
7. Find the percent by mass given the solute is 40 g and solution is 125 g $\frac{40}{125} \times 100 = 32\%$

$PV = nRT$ 0.875 273 0.0821 19.61L

Mar 28-7:01 AM

## Monday, April 1st

**Objective: Students will be able to determine the expression for the rate of a reaction.**

1. Bellringer
2. Notes: Collision Theory
3. Go over Q3 Test and Lab Report

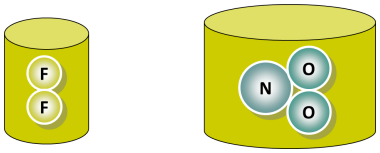
**DUE: nothing**

**HW: Kinetics Practice**

Mar 10-10:30 AM

## 1. Reactants must collide

In order for two molecules to react, they must come in contact with one another.

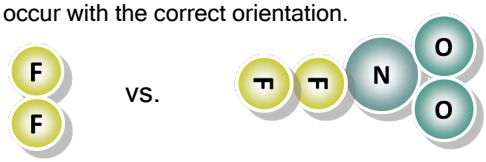



There's no way they'll ever react if the don't run into one another!

Apr 3-1:01 PM

## 2. Collisions must be in the correct orientation

For a collision to result in a chemical reaction, it must occur with the correct orientation.

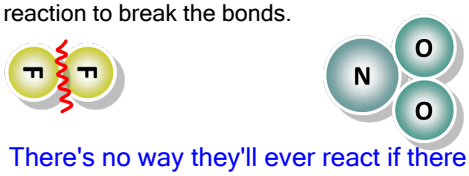



There's no way they'll ever react if they don't collide correctly!

Apr 3-1:01 PM

## 3. Collisions must have a minimum amount of energy

For a collision to result in a chemical reaction, it must occur with the minimum amount of energy for reaction to break the bonds.

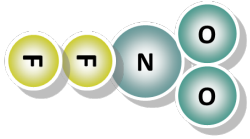



There's no way they'll ever react if there isn't enough energy!

Apr 3-1:02 PM

## Collision Theory

Activated Complex: a temporary, unstable arrangement of atoms in which old bonds are breaking and new bonds are forming.




Transition state is another name for activated complex.

Apr 3-1:02 PM

# Collision Theory

- Collisions with correct orientation must also have a sufficient amount of energy
- This amount of energy is called the activation energy.
- Symbol: $E_a$

$E_a$

QUESTION: How would a high vs low activation energy affect the speed of a reaction?

high $E_a$ → slower

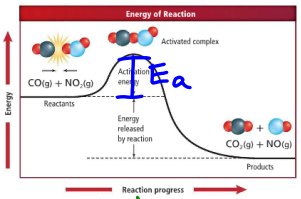
low $E_a$ → faster

Mar 14-3:19 PM

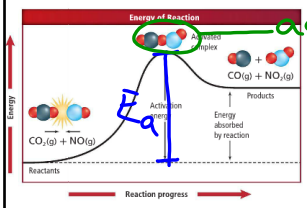
# Activation Energy

Reaction #1

exothermic
r have more E than P
faster ↓ $E_a$




activated complex




Reaction #2

endothermic
P more energy than r
more $E_a$

Mar 14-3:20 PM

# Factors Affecting Reaction Rate

1. Nature of Reactant – reactivity
2. Concentration – ↑concent, collisions↑
3. Surface Area – ↑s.a., ↑ chance correct orient.
4. Temperature – ↑T, more collisions, ↑ KE
5. Catalysts

Mar 14-3:21 PM

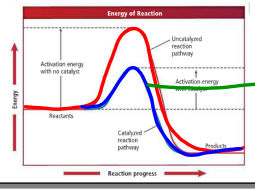
# Catalysts

Catalyst: substance that increases the rate of reaction without being used up.

> creates a lower energy reaction pathway

A + B + C --> AB + C

"C" is the catalyst.. it is present in the beginning and the end.




catalyst

Mar 14-3:22 PM