

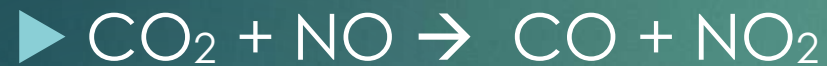


Chemistry

ENDOTHERMIC & EXOTHERMIC REACTIONS

Collision Theory

▶ Reactants in chemical reaction come together to form products.



(Reactants) (Products)

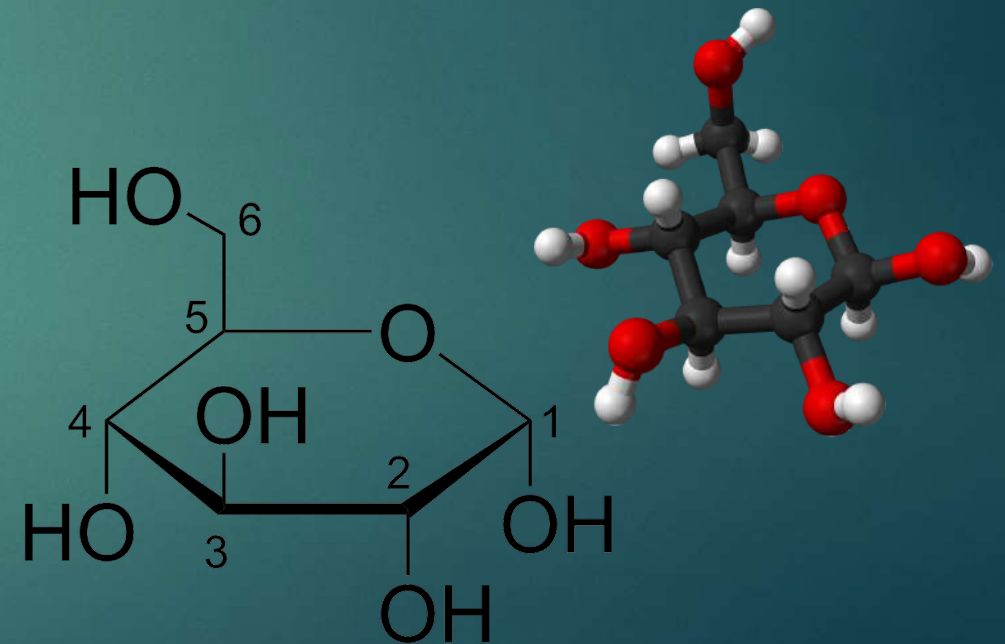
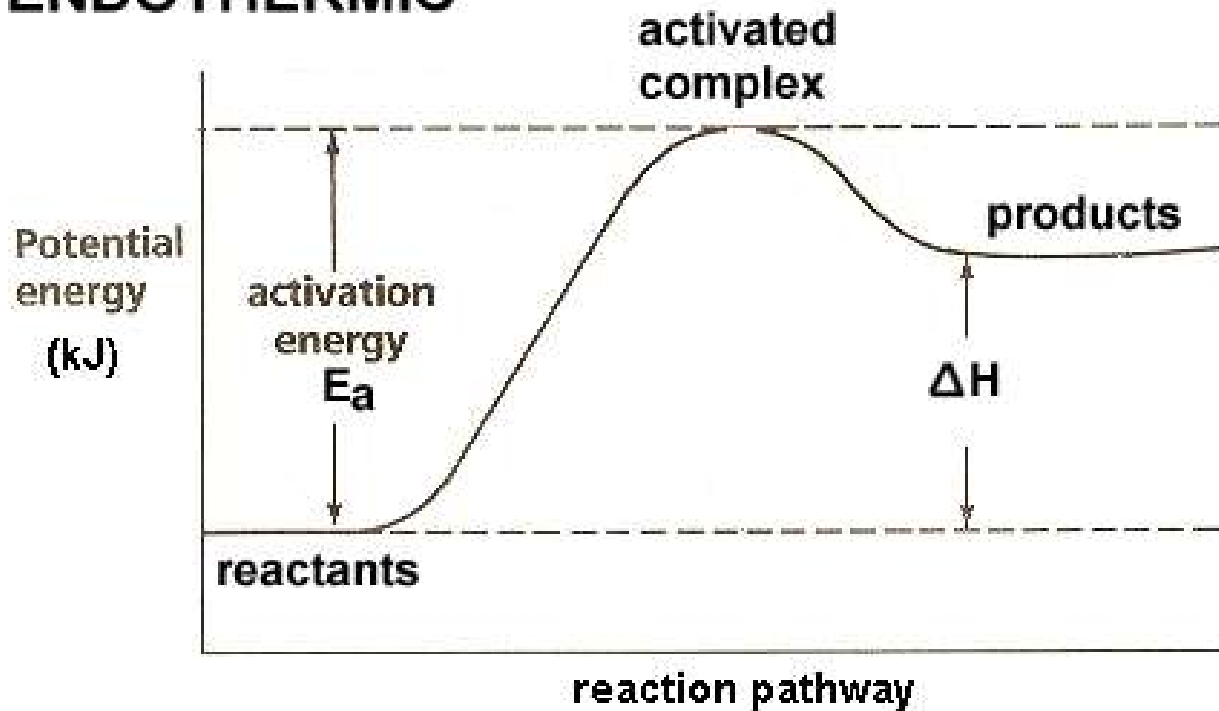
- ▶ Atoms, Ions & Molecules must collide in order to react.
- ▶ They must collide in the correct orientation
- ▶ They must collide with sufficient energy to form the activation Complex.

Activation Energy & Reactions

- ▶ In order for a chemical reaction to take place, even if it has a favorable orientation of the molecules, if there is not enough energy, the activation complex can not form.
- ▶ Analogy:
 - ▶ Pushing a cart up a hill, have to have enough energy to get it to the top.
 - ▶ Refrigerator cools and decreased the chemical reactions of decomposition of food
 - ▶ Stove & Oven heat and increase the rate of chemical reaction to cook the food.

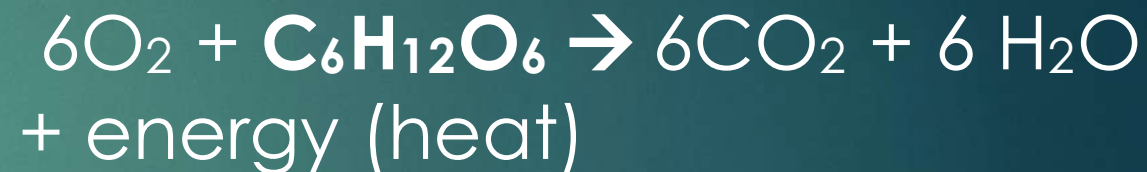
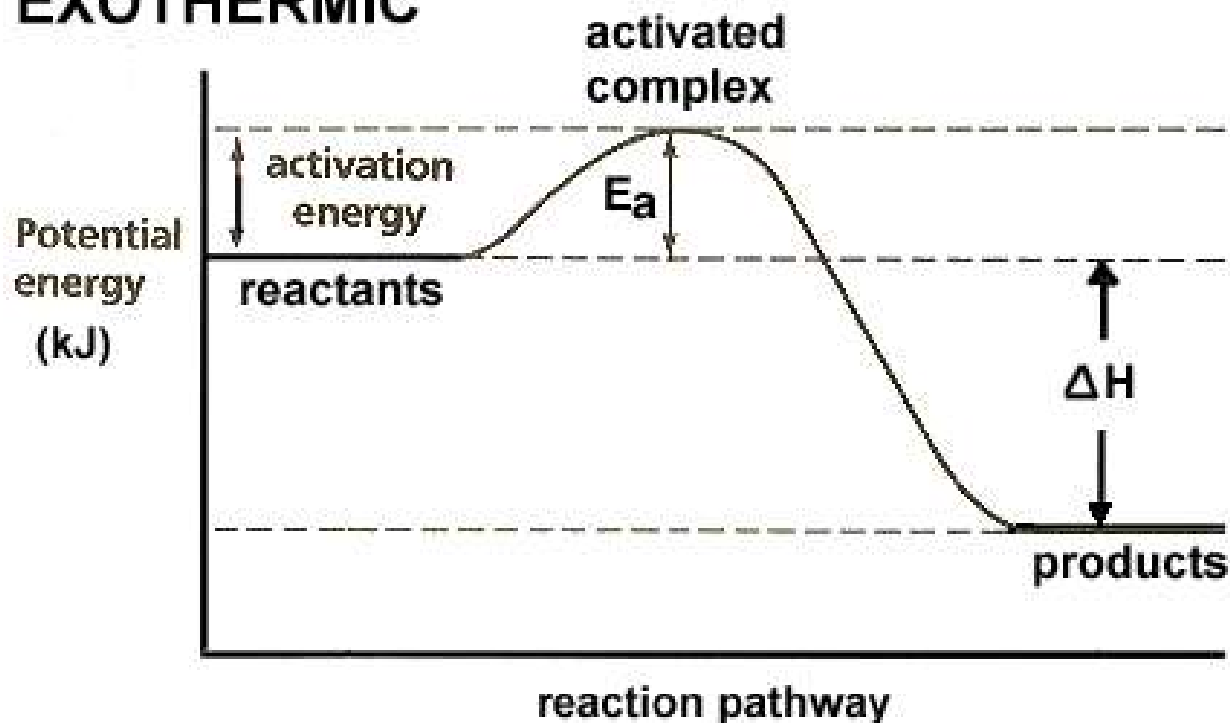
Endothermic Reactions

ENDOTHERMIC



Exothermic Reactions

EXOTHERMIC



Endothermic & Exothermic Reactions

▶ **Activity:** Your Turn Is it and endothermic or exothermic reaction?

▶ **Materials:**

- ▶ Get a partner
- ▶ Flask
- ▶ Balloon
- ▶ Sugar cube
- ▶ 20 ml warm water

▶ **Procedure:**

- ▶ In your Flask: Combine the 20 ml H₂O, 1 sugar cube, 1 tsp yeast
- ▶ Place the balloon on the flask
- ▶ Swirl the flask

▶ **Data:**

- ▶ What is happening?
- ▶ What do you feel on the bottom of the flask?
- ▶ What type of reaction is it?

Activity #2 – More Fun

- ▶ After Cleaning up your previous mess from Activity #1, get a model kit.
 - ▶ In this model kit identify what color balls represent what atoms.
 - ▶ Make any of the following molecules with your kit:
 - ▶ CO_2 ,
 - ▶ H_2O ,
 - ▶ CH_4 ,
 - ▶ NO ,
 - ▶ NO_2 ,
 - ▶ N_2

Computer Simulation Activity

- ▶ Google.com
- ▶ pHET - Chemistry
 - ▶ Practice running each of the 3 simulations:
 - ▶ States of Matter
 - ▶ Chemical Equations
 - ▶ Balloons & Buoyancy
 - ▶ Gas Properties
 - ▶ Take notes on what you learned for each one.

Adult Ed Project – Endothermic & Exothermic Reactions

.50 Credits



- ▶ The world around us is a constant state of Chemical Reactions. Whether we are eating, or planting a garden, thousands of chemical reactions are happening. Two such examples are: **Photosynthesis and Cellular Respiration**
- ▶ On a piece of paper Title the top with each of the two examples. (2 pieces of paper)
- ▶ Under the Title give a definition of what each is.
- ▶ Write an example of each and explain how it happens. (Research)
- ▶ Write the Chemical Equation for each.
- ▶ Explain each reaction as Endothermic or Exothermic and why.
- ▶ Draw the appropriate graph for that reaction labeling the Activation Energy, Reactants and Products, and the change in heat energy.

Works Cited

- ▶ Chemistry in the Community, p. 240 - 260, 2006, W.H. Freeman Co.
- ▶ Chemistry Matter & Change, p. 530 – 540, 2005, McGraw Hill, Glencoe