$\Delta H = H_{PRODUCTS} - H_{REACTANTS}$

$\Delta H = +$ ENDO

$\Delta H = -$ EXO

Name:_____

Blk:___Date:_____

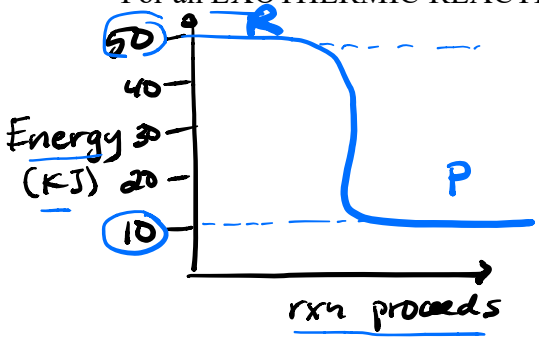
Chemistry 11

More on Endothermic and Exothermic Reactions

There are TWO DIFFERENT ways that a chemical equation can be written to illustrate if it is an endothermic or exothermic reaction:

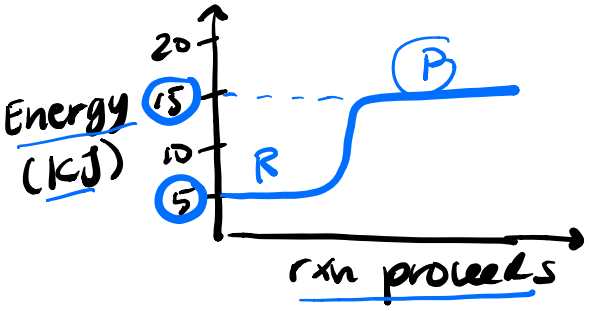
1. the heat term is included in the equation (heat/energy)
2. the ΔH value is given after the written equation (kJ)

For an EXOTHERMIC REACTION:



1. R → P + heat energy
   R → P + 40 kJ
2. R → P ; $\Delta H = -40$ kJ
   $\Delta H = H_P - H_R$
   $10 - 50$
   $= -40$ kJ

For an ENDOTHERMIC REACTION:



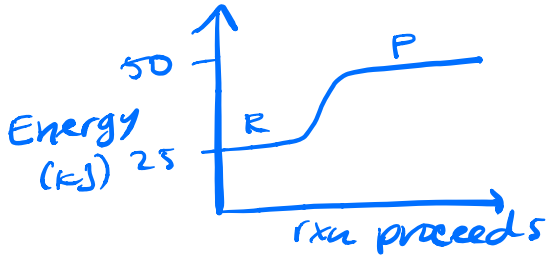
1. R + heat energy → P
   R + 10 kJ → P
2. R → P ; $\Delta H = +10$ kJ
   $\Delta H = H_P - H_R$
   $= 15 - 5$
   $= +10$ kJ

MEMORY AIDS:

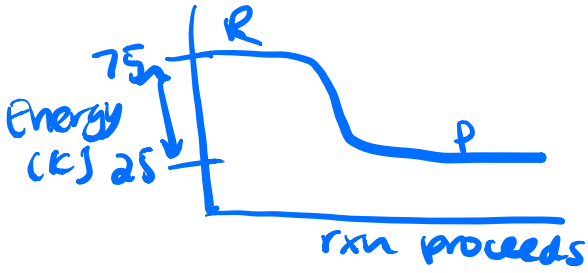
1. SUNG TO THE TUNE OF FRERE JACQUES:
Endothermic x2
Heat goes in
Exothermic x2
Heat leaves

2. In the English language it is common to state the positive before the negative: + → -
Positive ΔH endo
Negative ΔH exo

1. Draw an energy diagram having a ΔH = +25 KJ



2. Draw an energy diagram have a ΔH = -50 KJ



3. If the ΔH = -50 KJ for the reaction F→G. Re-write this equation to show the 50KJ on the correct side of the chemical equation.

$F \longrightarrow G + 50kJ$

4. If a reaction absorbs 30 KJ of heat, what is the ΔH for the reaction?

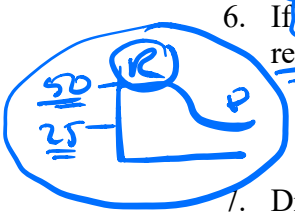
$\Delta H = +30\ kJ$

5. If a reaction gives off 40 KJ of heat, what is the ΔH for the reaction?

$\Delta H = -40\ kJ$

exo

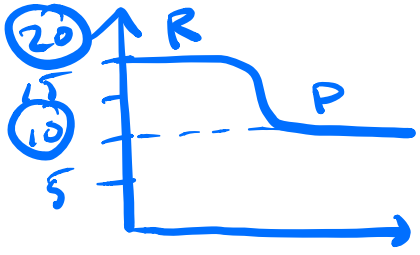
6. If P→Q +25 KJ what is the ΔH for the reaction? Which have more energy, the reactants or products?



$\Delta H = -25kJ$ Reactants

7. Draw an energy diagram for the reaction R→P +10 KJ. Will the surroundings feel warmer or cooler as the reaction proceeds?

exo



$\Delta H = H_P - H_R$
$10 - 20$
$= -10\ kJ$

hotter