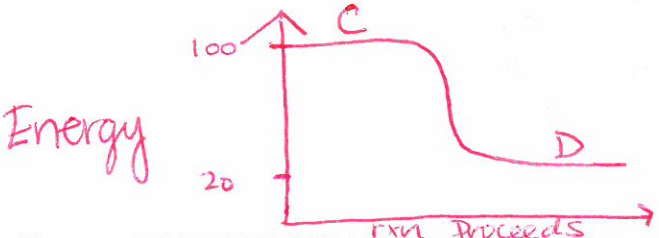
Name: Key
Blk:_____ Date:_____

Chemistry 11
More on Endothermic and Exothermic Reactions

There are TWO different ways that a chemical equation can be written to illustrate an exothermic or an endothermic reaction

1. with the heat term in the expression
2. with the ΔH @ the end of the expression

For an EXOTHERMIC REACTION:



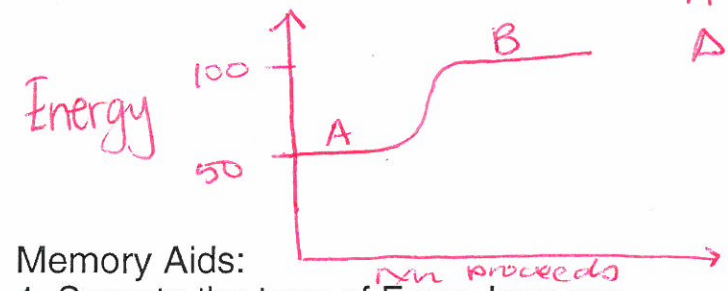
$C \longrightarrow D + 80\,kJ$ or $C \rightarrow D;\ \Delta H = -80$

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

$\Delta H = 20 - 100$

$\boxed{\Delta H = -80\ kJ}$

For an ENDOTHERMIC REACTION:



$A + 50\,kJ \longrightarrow B$ or $A \rightarrow B;\ \Delta H = +50$

$\Delta H = H_P - H_R$

$\Delta H = 100 - 50$

$\boxed{\Delta H = +50\ kJ}$

Memory Aids:

1. Sung to the tune of Frere Jacques:

Endothermic x2
HEAT GOES IN
Exothermic x2
HEAT LEAVES

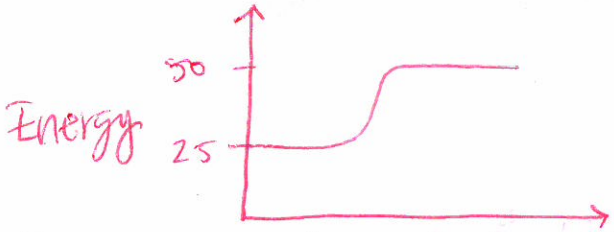
2. In the ENGLISH language it is common that we state the POSITIVE before the NEGATIVE:

\+ ---> -

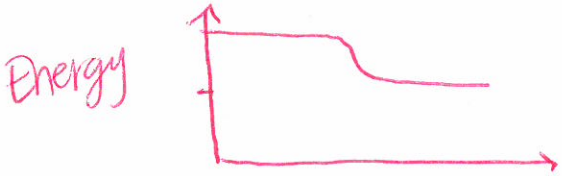
Positive ΔH = Heat term is on the REACTANT SIDE
Negative ΔH = Heat term is on the PRODUCT SIDE

Exothermic vs. Endothermic Exercises

1. Draw an energy diagram having a $\Delta H = +25$ kJ



2. Draw an energy diagram having a $\Delta H = -50$ kJ



3. $\Delta H = -50$ kJ for the reaction F --> G. Re-write this equation to show the 50 kJ on the correct side of the chemical equation.

F ⟶ G + 50 kJ

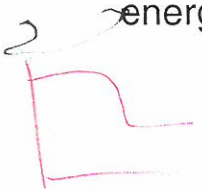
4. If a reaction absorbs 30 kJ of heat, what is the ΔH for the reaction?

$\Delta H = +30$ kJ

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

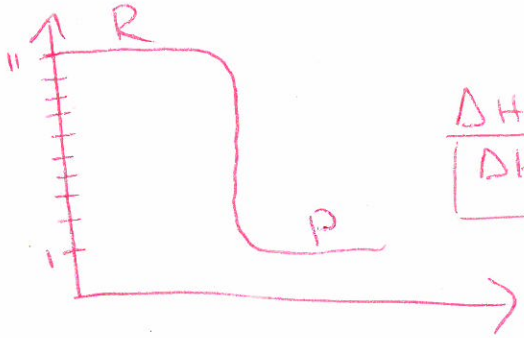
$\Delta H = -40$ kJ

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



$\Delta H = -25$ kJ The reactants have more energy

7. Draw a energy diagram for a reaction in which R ----> P + 10 kJ. Will the surroundings feel warmer or cooler as the reaction proceeds?



$\Delta H = 1 - 11$

$\Delta H = -10$ kJ

The surroundings will