

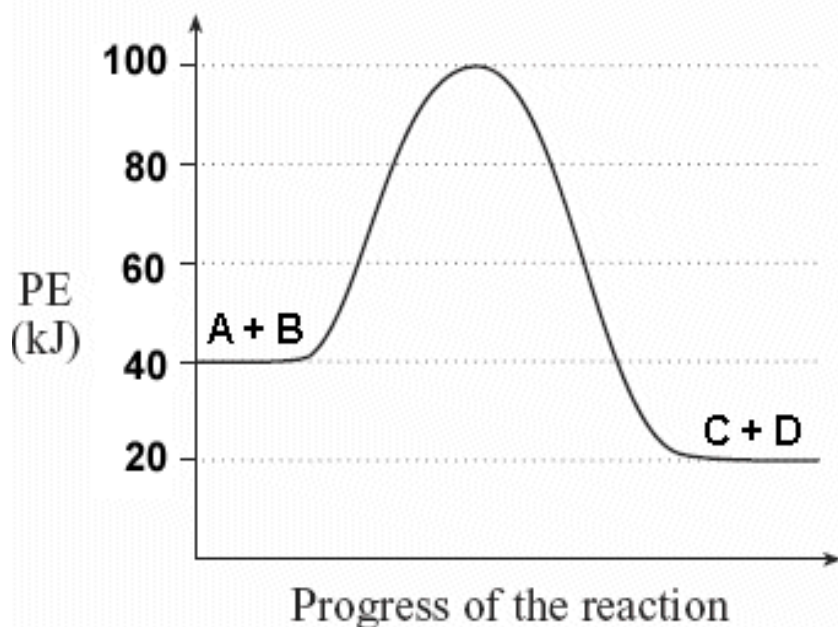
Potential Energy Diagrams

Warm Up:

1. Turn in Lab if you didn't on Monday and your Entropy Practice Questions
2. An ideal gas has a volume of 15.0L at STP. What will the volume of the gas be if pressure is increased to 5 atm?
3. In order for a chemical reaction to occur, particles must collide with enough _____ and with the correct _____.
4. List 3 ways that you can increase the rate of a chemical reaction.

Potential Energy Diagrams

In all chemical bonds, there is a certain amount of energy that is being _____. This type of energy is called _____ energy. Chemists can use diagrams called Potential Energy Diagrams to illustrate the potential energy (stored energy) changes that occur during specific chemical reactions.

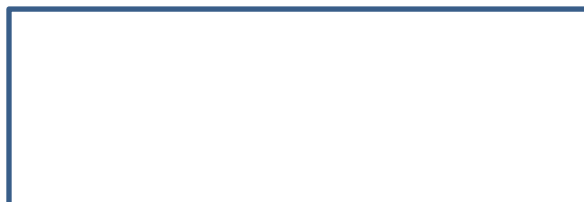


Components of a Potential Energy Diagram

Heat of REACTANTS – the amount of PE stored in the _____. ()

Heat of PRODUCTS – the amount of PE stored in the _____. ()

Heat of REACTION () – the amount of _____ energy LOST or GAINED through a reaction.

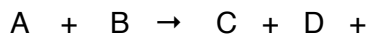


Exothermic vs. Endothermic Reactions

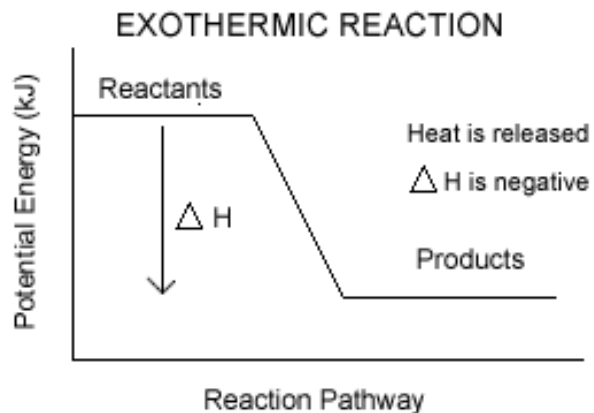
Recall, there are two types of reaction

1. Reactions that RELEASE energy →

a. ΔH is _____

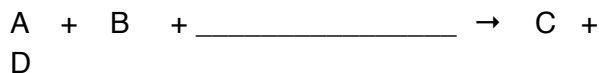


Ex: Sodium in water → Heat (and FIRE!) as product



2. Reactions that GAIN or ABSORB energy →

a. ΔH is _____



Ex: Cooking or baking (need an oven to supply the heat.



Whatever you do to chemical equation, you must also do to the Heat of Reaction: ΔH – CONSERVATION OF ENERGY.

Ex. If you REVERSE a reaction (flip the products and reactants), then you must _____ the sign for ΔH .

Ex. If you double the equation (or the coefficients/moles), then you must _____ the ΔH .

Table I (of the Reference Tables) tells us if particular reactions are exothermic or endothermic based on sign of the ΔH value.

	ΔH (kJ/mol)	Endothermic/Exothermic
1. $N_2(g) + 2O_2(g) \rightarrow 2NO_2(g)$		
2. $N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$.	
3. $2NH_3(g) \rightarrow N_2(g) + 3H_2(g)$		
4. $2C(s) + 2O_2(g) \rightarrow 2CO_2(g)$		
5. $CO_2(g) \rightarrow CO(g) + \frac{1}{2}O_2(g)$		