

IB Chemistry II

Vocabulary—Energetics I

1. Energy (E)--ability to do work (W) or transfer heat (Q).
2. Work (W)--energy used to cause an object with mass to move .
3. Heat (Q)--energy used to cause the temp of an object to rise .
4. Potential Energy (PE)--energy an object possesses by virtue of its position or chemical composition.
5. Kinetic Energy(KE)-- energy an object possesses by virtue of its motion.
6. Joule (J)--SI unit of energy. $1 \text{ J} = 1 \frac{\text{kg m}^2}{\text{s}^2}$
7. calorie (cal)--older, non-SI unit still in widespread use $1 \text{ cal} = 4.184 \text{ J}$
8. System--reactants and products
9. Surroundings--everything else associated with the reactants and products.
10. Enthalpy (H)--the internal energy of a system. The sum of all kinetic and potential energies of all components of the system.
11. Endothermic change-- heat is absorbed by the system from the surroundings.
12. Exothermic change--heat is released by the system to the surroundings.
13. Combustion Reaction-- a chemical reaction chemical that occurs between a fuel and an oxidizing agent that produces energy, usually in the form of heat and light.
14. Neutralization Reaction-- a chemical reaction in which an acid and a base interact with the formation of a salt
15. Calorimetry--the measurement of heat flow
16. Calorimeter—a device used to measure heat flow.
17. Specific Heat Capacity--amount of energy required to raise the temperature of 1 g of a substance by 1 degree K.

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Energetics 2 Vocabulary

1. Enthalpy of formation ΔH_f —Amount of energy evolved or absorbed in the formation of 1 mole of a substance in its normal state from its elements in their normal states.
2. Enthalpy of combustion ΔH_c -- Amount of energy evolved or absorbed when 1 mole of a compound undergoes complete combustion in the presence of excess oxygen to form products in their normal states.
3. Standard enthalpies of formation, ΔH_f —Enthalpy of formation measured under standard thermochemical conditions (25 C and 101.3 kPa pressure).
4. Born-Haber cycle-- Representation of atomization energy, ionization energy, electron affinity, and lattice energy coming together to represent the enthalpy involved in the formation of an ionic compound.
5. Ionization Energy--Amount of energy required to remove an electron from a gaseous atom or ion.
6. Electron Affinity-- Energy change accompanying the addition of an electron to a gaseous atom
7. Standard Enthalpy of Atomization-- Enthalpy change required to produce 1 mole of gas atoms of an element from the element in the standard state.
8. Lattice Energy--Energy required to completely separate a mole of a solid ionic compound into its gaseous ions—OR--Energy released when gaseous ions combine to form an ionic solid.
9. Entropy-- Measure of the randomness (disorder) of a system.
10. Second Law of Thermodynamics--The entropy of the universe increases for spontaneous processes, and the entropy of the universe does not change for reversible processes.
11. Third Law of Thermodynamics-- The entropy of a pure crystalline substance at absolute zero is 0.
12. Gibbs Free Energy ΔG° --Uses both ΔH and ΔS to predict the spontaneity of a reaction.