

A-Level Chemistry

Name: _____ Score: _____

1. The lattice energy is:
 - ☐ the (negative) energy change when one mole of solid lattice forms from gaseous ions
 - ☐ the energy to make gaseous atoms
 - ☐ always positive
 - ☐ the energy to remove an electron
 2. The enthalpy change of hydration is:
 - ☐ always endothermic
 - ☐ the energy to break the lattice
 - ☐ zero
 - ☐ exothermic – energy released when gaseous ions are surrounded by water
 3. Entropy is a measure of:
 - ☐ the number of ways the particles and their energy can be arranged (disorder)
 - ☐ the temperature
 - ☐ the energy released by a reaction
 - ☐ the mass of a substance
 4. The Gibbs free energy change is calculated as:
 - ☐ $\Delta G = \Delta H + T\Delta S$
 - ☐ $\Delta G = T\Delta S - \Delta H$
 - ☐ $\Delta G = \Delta H - T\Delta S$
 - ☐ $\Delta G = \Delta H \times \Delta S$
 5. Going down Group 17, the first electron affinity becomes:
 - ☐ always positive
 - ☐ unchanged
 - ☐ less exothermic, because the larger atom attracts the electron less strongly
 - ☐ more exothermic
 6. The enthalpy change when one mole of gaseous ions dissolves in water is the enthalpy of _____.
- _____

7. Entropy decreases when a solid melts or a gas is formed.

☐ True ☐ False

8. A reaction is feasible when the Gibbs free energy change ΔG is _____.

9. The enthalpy change when one mole of an ionic solid forms from gaseous ions is the _____ energy.

10. Enthalpy of solution can be found from lattice energy and hydration enthalpies using Hess's law.

☐ True ☐ False

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1. **the (negative) energy change when one mole of solid lattice forms from gaseous ions**

Strong ionic bonds form, so lattice energy is exothermic (negative).

2. **exothermic – energy released when gaseous ions are surrounded by water**

Water molecules are attracted to the ions, releasing energy, so hydration is exothermic.

3. **the number of ways the particles and their energy can be arranged (disorder)**

More ways to arrange particles/energy means higher entropy (more disorder).

4. **$\Delta G = \Delta H - T\Delta S$**

$\Delta G^\circ = \Delta H^\circ - T\Delta S^\circ$, with T in kelvin.

5. **less exothermic, because the larger atom attracts the electron less strongly**

A bigger atom pulls the incoming electron in less strongly, so EA is less exothermic.

6. **hydration**

More negative for smaller, more highly charged ions.

7. **False**

False. Melting and forming a gas increase disorder, so entropy increases.

8. **negative**

$\Delta G = \Delta H - T\Delta S$.

9. **lattice**

Born–Haber cycles use Hess’s law to find it.

10. **True**

A Hess cycle links them.