OCR (A) Chemistry A-level

Topic 5.2.2 - Enthalpy and entropy

Flashcards

Define entropy

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A measure of the dispersal of energy in a system which is greater when the system is more disordered

What is the symbol of entropy?

What is the symbol of entropy?

S

Solid or gas, which is more disordered?

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Gas

What is the unit of standard entropy?

What is the unit of standard entropy?

$J\ K^{-1}\ mol^{-1}$

How does temperature affect entropy?

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The greater temperature particles have more energy and move more. Thus the arrangement of particles become more randon. More random arrangement = higher entropy

When a solid ionic lattice is dissolved in solution what happens to entropy?

When a solid ionic lattice is dissolved in solution what happens to entropy?

Entropy increases because the ions are more disordered

How does change in number of gas molecules in a reaction affect entropy?

How does change in number of gas molecules in a reaction affect entropy?

Increase in number of gas molecules = increase in entropy

Decrease in number of gas molecules = decrease in entropy

Write the equation used to calculate entropy change

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$$\Delta S^{\theta}_{reaction} = \Sigma S^{\theta}_{products} - \Sigma S^{\theta}_{reactants}$$

Write the Gibbs' free energy equation and state what each symbol means

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

ΔG- *Gibbs Free Energy, or "available energy"*

ΔH- *Enthalpy change*

T- *Temperature in Kelvin*

ΔS- *Entropy change*

Fill in the columns

ΔH	ΔS	ΔG	Feasibility of spontaneous change
Negative	positive		

Fill in the columns

ΔH	ΔS	ΔG	Feasibility of spontaneous change
negative	positive	Always negative	Reaction feasible

Fill in the columns

ΔH	ΔS	ΔG	Feasibility of spontaneous change
Positive	neagtive		

Fill in the columns

ΔH	ΔS	ΔG	Feasibility of spontaneous change
Positive	Negative	Always positive	Reaction never feasible

Fill in the columns

ΔH	ΔS	ΔG	Feasibility of spontaneous change
Positive	positive		

Fill in the columns

ΔH	ΔS	ΔG	Feasibility of spontaneous change
positive	positive	Negative at high temperatures	Feasible at high temperatures

Fill in the columns

ΔH	ΔS	ΔG	Feasibility of spontaneous change
Negative	Negative		

Fill in the columns

ΔH	ΔS	ΔG	Feasibility of spontaneous change
Negative	Negative	Negative at low temperatures	Reaction feasible at low temperature

For a reaction to occur spontaneously ΔG must be positive or negative?

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Negative

What are the limitations of the predictions of feasibility made by using ΔG?(2)

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- Reaction may have high activation energy
- Rate of reaction may be very slow