

Entropy – Measure of disorder, randomness, chaos

ΔS = change in entropy = entropy of products minus entropy of reactants

Positive ΔS = entropy was gained = products have more entropy than reactants

Negative ΔS = entropy was lost = products have less entropy than reactants

Entropy will increase in these situations:

1. Solid \rightarrow liquid \rightarrow gas
2. Small number of reactant species combine to form a larger number of product species (coefficients)
3. More moles of gas are produced
4. Volume of a gas is increased/pressure of a gas is decreased
5. Solid dissolving in water
6. Temperature increases

Process	Increase or Decrease in Entropy?	ΔS (positive or negative?)
1. Snow melting		
2. Salt dissolving in H ₂ O		
3. Liquid cooling		
4. H ₂ O (l) \rightarrow H ₂ O (s)		
5. 2 Al (s) + 3 I ₂ (s) \rightarrow 2 AlI ₃ (s)		
6. N ₂ (g) + 3H ₂ (g) \rightarrow 2 NH ₃ (g)		
7. Ag ⁺ (aq) + Cl ⁻ (aq) \rightarrow AgCl(s)		
8. Dissolving of sugar in hot coffee		
9. Sublimation of a solid		
10. Increasing the volume of a gas		
11. Condensation of water		
12. H ₂ (g) + Br ₂ (l) \rightarrow 2 HBr(g)		
13. CuSO ₄ (s) \rightarrow Cu ²⁺ (aq) + SO ₄ ²⁻ (aq)		