

Thermodynamics (Classical) for Biological Systems

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Correspondence between the course material and chapter in the text book

Topic	Corresponding chapter in SVA
<i>Module 2: Additional useful thermodynamic functions</i>	
The thermodynamic functions H, A and G	6
Concept of chemical potential	10
Equations for a closed system, Maxwell's relations	6
Gibbs-Duhem equation	10
Thermodynamic analysis of processes – lost work, irreversibility	16
<i>Module 3: Thermodynamic properties of pure fluids</i>	
Review of ideal gas, non-ideal gas, fugacity, fugacity coefficient	10
PVT behaviour, virial and cubic equations of state, generalized correlations	3
Residual properties	6
Estimation of thermodynamic properties using equations of state	13
Estimation of the fugacity coefficient.	10
<i>Module 4: Thermodynamic properties of solutions</i>	
Ideal and non-ideal solutions, partial molar properties, excess properties of mixtures, activity coefficient and its estimation.	10
<i>Module 5: Phase Equilibria</i>	
Criteria for phase equilibria	10
Phase rule	2
Clausius-Clayperon equation	6
VLE for pure component, VLE for multi-component system	11
<i>Module 6: Reaction Equilibria</i>	
Equilibrium criteria for homogenous reactions, evaluation of equilibrium constant, effect of temperature and pressure on equilibrium constant	15
Ionic equilibria	None