

- *The second law of thermodynamic*
 - *statement of the second law*
 - *Spontaneous process and nonspontaneous process*
 - *Entropy*
 - *Entropy of Global system(universe)*
 - *Entropy of the system and surrounding*
 - *Entropy of physical transformation*
 - *Entropy of isothermal expansion*
 - *Entropy of heating the system*
 - *Entropy of irreversible changes*
 - *Work efficiency*
 - *Carnot cycle*
 - *Trouton`s rule*
 - *Third law of thermodynamics*
 - *Helmholtz functions and the maximum work*
 - *Gibbs free energy*
 - *Gibbs free energy and non-expansion work*
 - *Combination of 1st and 2nd law of thermodynamics*
 - *Maxwell relations*
 - *The temperature dependency of Gibbs free energy*
 - *The pressure dependency of Gibbs free energy*
 - *Chemical potential*
 - *Fugacity*
- *Phases diagram and Physical transformation of pure substances*
 - *Phase , commonest and degree of freedom*
 - *The phase rule*
 - *One –component system*
 - *Two-component system*
 - *Vapour-pressure diagram*
 - *Composition of the Vapour*
 - *Temperature –composition diagram*
 - *Phase boundaries*
 - *Boiling point*
 - *Melting point*
 - *Triple point*
 - *Phase solubility and phase transition*
 - *The temperature dependence of phase stability*
 - *The respond melting to application pressure*
 - *Chemical potential and equilibrium*
 - *Claperyon and claperon Clauses-equation*
- *Mixtures*
 - *Thermodynamic description of mixtures*

- *Partial molar quantities*
 - *Partial molar volume*
 - *Partial molar Gibbs free energy*
 - *Chemical potential and partial molar Gibbs free energy*
 - *The Gibbs-Duhem equation*
 - *Gibbs energy of mixing*
 - *Entropy of mixing*
 - *Raoults law*
 - *Ideal solution and non-ideal solution*
 - *Henry's law of ideal-dilute solution*
 - *Properties of solution*
- *Chemical equilibrium*
- *The reaction Gibbs energy*
 - *Exergonic and endothermic reactions*
 - *Thermodynamic equilibrium constant*
 - *Vant Hoff equations*
 - *Kc, Kp, Kx*
 - *Lechatelier principle*

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