

CH 834 Statistical Thermodynamics

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Textbooks: a) Statistical Mechanics, D.A.McQuirrie, Harper and Row Publishers, ISBN 06-044366-9 ; b) Equilibrium Statistical Mechanics, M.Plishke and B.Bergersen, Prentice Hall Publishers, ISBN 0-13-283276-3 + problem solver manual for this book;

Supplementary textbooks: a) Statistical Mechanics, R.P.Feynman, Addison-Wesley Publishing Co, ISBN 0-8053-2509-3; b) Soft Condensed Matter, R.Jones, Oxford U Press, ISBN 0 19 850589 2 ; c) Liquid State Physics, N.March and M.Tosi, World Scientific, ISBN 981-02-4652-8

Syllabus

1. Lagrangian and Hamiltonian mechanics
2. Liouville theorem and ergodicity
3. Statistical meaning of entropy
4. Microcanonical, canonical and grand canonical statistical ensembles
5. Statistical thermodynamics of nonideal gases.
6. Distribution functions and equations of state
7. Scattering form factors and sum rules.
8. Ising model :an introduction
9. Lattice models of phase transitions
- 10.Simple liquids and polymer liquids
- 11.Polyatomic molecules and solids
- 12.Electrolytes and polyelectrolytes
13. Disordered systems : percolation, glasses, etc.