

JML 310

Bonding, Structure, Symmetry, and Physical Properties

(3-0-0)

Instructors: Prof. Tapas K Maji & Prof. A. Sundaresan

Periodic properties of elements, Chemical bonding (concept of hybridization, molecular orbital theory with some examples of simple molecules), Ionic bonding and structure of some ionic compounds (radius ratio rule) and shape of the molecules (considering the VSEPR theory), Bonding in coordination compounds considering VBT, CFT and MOT, Jahn-Teller distortion, electronic spectra and magnetic properties of Coordination compounds with some examples. [15 hours]

Symmetry operations, point groups, and space groups. Crystallographic description of crystal structures. Representations of point groups, reducible and irreducible representations, Great orthogonality theorem, and character tables. Tensors and Physical properties, Jahn-Teller effects and properties of solids, Landau theory of phase transitions. [30 hrs]