

Bond-Orientational Order in Condensed Matter Systems; 388 pages; 2012; 9781461228127; Katherine J. Strandburg; Springer Science & Business Media, 2012

Bond order is the number of chemical bonds between a pair of atoms and indicates the stability of a bond. For example, in diatomic nitrogen, N_2 , the bond order is 3; in acetylene, $H-C\equiv C-H$. Bond order is the number of chemical bonds between a pair of atoms and indicates the stability of a bond. For example, in diatomic nitrogen, N_2 , the bond order is 3; in acetylene, $H-C\equiv C-H$, the carbon-carbon bond order is also 3, and the $C-H$ bond order is 1. Bond order and bond length indicate the type and strength of covalent bonds between atoms. Bond order and length are inversely proportional to each other: when bond order is increased, bond length is decreased.

Introduction. Chemistry deals with the way in which subatomic particles bond together to form atoms. Examples in which bond-orientational effects play an important role are liquid crystals, quasicrystals, and two-dimensional crystals. This book contains contributions by many of the foremost researchers in the field. The chapters are tutorial reviews of the subject, written both for the active researcher looking for a review of a topic and for the graduate student investigating an exciting area of research. The focus of this book is on the contribution made by the ordering of bond orientations (as distinguished from the orientations of the molecules themselves) on the behavior of condensed systems, particularly their phase transitions. Examples in which bond-orientational effects play an important role are liquid crystals, quasicrystals, and two-dimensional crystals. ordering (interhelical separation, bond orientational order. parameter, ^{31}P -NMR spectra) are all measured concurrently. with the free energy and/or its derivatives. and long-range bond orientational order in the plane perpendicular to the average nematic director, revealed by the. On leave from: J. Stefan Institute, Ljubljana, Slovenia. To determine at which D spacing the system changes phases, we plotted the spectral first moment, M_1 Eq. 2, as a function. 1L 25 35 45 55. Microscopic description of bond orientational order in simple liquids. V. N. Ryzhov, E. E. Tareeva. Abstract: A microscopic approach to the transition of isotropic liquid into an anisotropic phase is suggested. The long-range behaviour of the correlation function of the orientational fluctuations of the pair distribution function is analysed. An attempt is made to estimate the instability point in systems of hard disks and hard spheres. Full text: PDF file (1192 kB) References: PDF file HTML file. English version: Theoretical and Mathematical Physics, 1987, 73:3, 1344-1352.