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# Cooperative Phenomena in Jahn–Teller Crystals

*Michael D. Kaplan  
and  
Benjamin G. Vekhter*

# [MOBI] Cooperative Phenomena In Jahn—Teller Crystals (Modern Inorganic Chemistry)

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**Cooperative Phenomena in Jahn—Teller Crystals**-Michael D. Kaplan 2012-12-06 This book by Kaplan and Vekhter brings together the molecular world of the chemist with the condensed matter world of the physicist. Prior to the collapse of the Soviet Union, chemists in the West devoted lit to relationships between molecular electronic structure and tle attention solid-state vibronic phenomena. Treating quantum mechanical problems wherein the adiabatic Born-Oppenheimer approximation fails was done by "brute force. " With bigger and better computers available in the West, molecular orbital calculations were done on observed and conceived static structures with little concern for any cooperativity of vibrational behavior that might connect these states. While it had long been understood in the West that situations do occur in which different static structures are found for molecules that have identical or nearly identical electronic structures, little attention had been paid to understanding the vibrational states that could connect such structures. It was easier to calculate the electronic structure observed with several possible distortions than to focus on ways to couple electronic and vibrational behavior. In the former Soviet Union, computational power was not as acces sible as in the West. Much greater attention, therefore, was devoted to conserving computational time by considering fundamental ways to han dle the vibrational connectivity between degenerate or nearly degenerate electronic states.

**Vibronic Interactions: Jahn-Teller Effect in Crystals and Molecules**-Michael D. Kaplan 2001-10-31 The Jahn-Teller effect is manifested in a variety of phenomena in physics, chemistry and biochemistry, in many types of crystals and molecules. This book deals with fundamental questions of the quantum mechanics of systems with orbital electrons, concentrating on novel phenomena and materials such as colossal magnetoresistance, high Tc superconductivity, buckminsterfullerenes, magnetic materials and biologically important clusters. All chapters share a common general approach to the problems, based on the analysis of vibronic interaction: electron-vibrational interaction in molecules and electron-phonon interaction in crystals. With an introductory address by Edward Teller.

**Bulletin of the Academy of Sciences of the USSR.-Akademiia nauk SSSR.** 1975

**Acta Physica Slovaca-** 1996

**The Jahn-Teller Effect**-Horst Kappel 2016-05-01 The Jahn-Teller effect continues to be a paradigm for structural instabilities and molecular dynamical processes. This volume provides a survey of the current Jahn-Teller interactions at the interface of quantum chemistry and condensed matter physics.

**The Jahn-Teller Effect and Beyond**-Isaak Borisovich Bersuker 2008

**Cooperative Phenomena**- 1983

**Journal of the Physical Society of Japan**-  
Nihon Butsuri Gakkai 2001

**Physics of Impurity Centres in Crystals**- 1972

**Laser Induced Fluorescence Spectroscopy of CHD<sub>2</sub>O and CHD<sub>2</sub>DO High- Resolution Infrared Spectroscopy of CH<sub>3</sub>O and HFCO**-  
Ilija Jakov Kalinovski 2001

**Physical Acoustics: Principles and Methods**-  
Warren Perry Mason 1964

**American Book Publishing Record**- 1995

**The British National Bibliography**-Arthur James Wells 1995

**Seria Fizyka**- 1978

**International Conference on Solid State Crystals 2000**-Antoni Rogalski 2001

**Proceedings of the Indian National Science Academy**-Indian National Science Academy 2004

**Proceedings of the Symposium on Magnetism and Magnetic Materials**- 1960

**Vibronic Interactions and the Jahn-Teller Effect**-Mihail Atanasov 2011-11-23 The concepts of the Jahn-Teller effect and vibronic coupling are being applied to more and more systems in both chemistry and physics. Aspects of structural chemistry such as the distortion of the nuclear framework to a lower-symmetry conformation have received an increasing attention, as well as the dynamics on the coupled potential energy

surfaces. The Jahn-Teller intersections are now recognized as prototype cases of conical intersections where the nuclear motion is known to be inherently nonadiabatic in nature and interchanges freely between the different potential energy surfaces. In the condensed phase especially, the significance of the Jahn-Teller effect has been increasingly appreciated, following the discovery of superconductivity in the fullerenes and of very large ("colossal") magnetoresistance in the manganite perovskites. Indeed, these materials are particularly challenging since the Jahn-Teller interaction competes with electronic correlation effects. **Vibronic Interactions and the Jahn-Teller Effect: Theory and Applications** provides an in-depth discussion of the Jahn-Teller effect and vibronic interactions as reflected by the contributions presented at the XX International Conference on the Jahn-Teller effect, Fribourg, Switzerland, 2010. The following topics have been treated in a clear and concise way: • Complex topologies of Jahn-Teller effect and conical intersections • Multi-state vibronic interactions on strongly coupled potential energy surfaces • Interplay of vibronic and spin-orbit coupling • Strain in Jahn-Teller systems and cooperative Jahn-Teller effect • Orbital ordering and its relation to ferromagnetism, ferroelectricity and molecular magnets • The Jahn-Teller effect in icosahedral systems • The Jahn-Teller effect and high temperature superconductivity This book is of interest to a wide audience including academic and industrial theoretical and experimental physicists, chemists, spectroscopists, and crystallographers.

**Japanese Journal of Applied Physics**- 2006

**Low Temperature Physics**- 1996

**LT 21: Low temperature properties of solids I**- 1996

**Fragments of Molecules**-Timothy Andrew Barckholtz 1998

**The Physics and Chemistry of Solids**- 1969

**Mössbauer Spectroscopy Applied to**

**Magnetism and Materials Science**-G.J Long  
1993 Volume 2 presents the latest applications of Mössbauer spectroscopy to the study of magnetic materials. Topics include: Surface and thin film analysis, iron-based amorphous ribbons and wires, diffusion studies, analytical methods for Mössbauer spectral analysis of complex materials, and quasicrystalline materials among others. These discussions will be invaluable to materials scientists, inorganic chemists, and solid-state chemists.

**The Journal of the Korean Physical Society**-  
2008

**Chemical Abstracts**- 2002

**Magnetism: Spin arrangements and crystal structure, domains, and micromagnetics**-  
George Tibor Rado 1963

**McGraw-Hill Encyclopedia of Science & Technology**- 1997 A comprehensive, 20-volume reference encyclopedia on science and technology.

**Acta Physica Polonica**- 1977 Section A includes general physics, solid state physics, applied physics.

**Bulletin of Thermodynamics and Thermochemistry**- 1973

**Physics Briefs**- 1993

**Bell Laboratories Talks and Papers**-Bell Telephone Laboratories. Libraries and Information Systems Center 1975

**JETP Letters**- 1983

**INIS Atomindex**- 1987

**Introduction to the Magnetic Properties of Solids**-Ardhendu Sekhar Chakravarty 1980

**Handbook on the Physics and Chemistry of Rare Earths**-Karl A. Gschneidner (Jr.) 1978

**Soviet Physics, JETP.**- 1985

**Indian Science Abstracts**- 1989

**Physics in Canada**- 1973

**Risø-R.**- 1987