

References

- [1] Sasaki S, Prewitt CT, Bass JD, Schulze W. Orthorhombic perovskite CaTiO_3 and CdTiO_3 : structure and space group. *Acta Crystallographica Section C: Crystal Structure Communications* 1987;43:1668-74.
- [2] Aleksandrov K, Bartolomé J. Structural distortions in families of perovskite-like crystals. *Phase Transitions: A Multinational Journal* 2001;74:255-335.
- [3] Goldschmidt VM. Die gesetze der krystallochemie. *Naturwissenschaften* 1926;14:477-85.
- [4] Jonker G, Van Santen J. Ferromagnetic compounds of manganese with perovskite structure. *physica* 1950;16:337-49.
- [5] Van Santen J, Jonker G. Electrical conductivity of ferromagnetic compounds of manganese with perovskite structure. *Physica* 1950;16:599-600.
- [6] Blundell S. Magnetism in condensed matter: oxford master series. *Condensed Matter Physics (Oxford Series Publications, 2001)* 2001.
- [7] Thouless D. Magnetism in Condensed Matter by Stephen Blundell. *American Journal of Physics* 2003;71:94-.
- [8] Cullity BD, Graham CD. *Introduction to magnetic materials*: John Wiley & Sons; 2011.
- [9] Motovilova E, Huang S. *Magnetic Materials for Nuclear Magnetic Resonance and Magnetic Resonance Imaging*. 2017.
- [10] Julien CM, Ait-Salah A, Mauger A, Gendron F. Magnetic properties of lithium intercalation compounds. *Ionics* 2006;12:21-32.
- [11] Díaz-Pardo R, Valenzuela R. Characterization of magnetic phases in nanostructured ferrites by electron spin resonance. *Advanced Electromagnetic Waves* 2015:210-37.
- [12] Li L, Lin L, Yan Z, He Q, Liu J-M. Multiferroicity and phase transitions in Tm-substituted GdMnO_3 . *Journal of Applied Physics* 2012;112:034115.
- [13] Samantaray S, Mishra D, Pradhan S, Mishra P, Sekhar B, Behera D, et al. Correlation between structural, electrical and magnetic properties of GdMnO_3 bulk ceramics. *Journal of Magnetism and Magnetic Materials* 2013;339:168-74.
- [14] Lin L, Li L, Yan Z, Tao Y, Dong S, Liu J-M. Ferroelectricity of polycrystalline GdMnO_3 and multifold magnetoelectric responses. *Applied Physics A* 2013;112:947-54.
- [15] Vasquez JC, Téllez DL, Collazos C, Rojas JR. Structural and magnetic characterization of the new $\text{GdMn}_{1-x}\text{Fe}_x\text{O}_3$ perovskite material. *Journal of Physics: Conference Series: IOP Publishing*; 2016. p. 012087.

- [16] Prakash BJ, Kumar KN, Buddhudu S. Thermal, magnetic and electrical properties of multiferroic GdMnO₃ nano particles by a co-precipitation method. *Ferroelectrics Letters Section* 2012;39:104-16.
- [17] Singh D, Gupta R, Bamzai K. Electrical and magnetic properties of GdCr_xMn_{1-x}O₃ (x= 0.0, 0.1) multiferroic nanoparticles. *Journal of Materials Science: Materials in Electronics* 2017;28:5295-307.
- [18] Negi P, Dixit G, Agrawal H, Kumar H, Srivastava R, Sati P, et al. Tuning of structural and optical properties by sintering of multiferroic GdMnO₃ precursor. *Ferroelectrics* 2017;519:200-8.
- [19] Negi P, Kumar H, Agrawal H, Srivastava R. Magnetic anomalies in specific heat and dielectric properties of multiferroic GdMnO₃. *AIP Conference Proceedings: AIP*; 2013. p. 96-7.
- [20] Bukhari S, Ahmad J. Infrared active phonons and optical band gap in multiferroic GdMnO₃ studied by infrared and UV-visible spectroscopy. *Acta Phys Pol A* 2016;129:43.
- [21] Nandy A, Roychowdhury A, Kar T, Das D, Pradhan SK. Effect of sodium doping on the microstructure, lattice distortion and magnetic properties of GdMnO₃ tiny single crystals. *RSC Advances* 2016;6:20609-20.
- [22] Das R, Jaiswal A, Poddar P. Static and dynamic magnetic properties and interplay of Dy³⁺, Gd³⁺ and Mn³⁺ spins in orthorhombic DyMnO₃ and GdMnO₃ nanoparticles. *Journal of Physics D: Applied Physics* 2012;46:045301.
- [23] Qu N, Li Z. A Novel Wet-Chemical Route for Synthesis of Multiferroic AMnO₃ (A= Gd, Tb, Dy) Particles and Its Structural, Optical and Magnetic Properties. *Journal of Superconductivity and Novel Magnetism* 2018;31:2869-77.
- [24] Noda K, Nakamura S, Nagayama J, Kuwahara H. Magnetic field and external-pressure effect on ferroelectricity in manganites: Comparison between Gd Mn O₃ and Tb Mn O₃. *Journal of applied physics* 2005;97:10C103.
- [25] Moure Jiménez C, Gutiérrez D, Durán Botia P, Peña O, Ghanimi K. Spin reversal in Gd (Me, Mn) O₃ (Me= Co, Ni). 2004.
- [26] Sarguna R, Sridharan V, Samatham SS, Ganesan V, Bhardwaj S, Awasthi A, et al. Structural, magnetic, and dielectric studies on Gd_{0.7}Y_{0.3}MnO₃. *Journal of Physics: Condensed Matter* 2014;26:345901.
- [27] Pal A, Prellier W, Murugavel P. Spin-flop and magnetodielectric reversal in Yb substituted GdMnO₃. *Journal of Physics: Condensed Matter* 2018;30:125801.
- [28] Modi A, Gaur N. Structural, electrical and magnetic phase evolution of Cr substituted GdMn_{1-x}Cr_xO₃ (0 ≤ x ≤ 0.2) manganites. *Journal of Alloys and Compounds* 2015;644:575-81.

- [29] Lin C, Zhang Y, Liu J, Li X, Li Y, Tang L, et al. Pressure-induced structural change in orthorhombic perovskite GdMnO₃. *Journal of Physics: Condensed Matter* 2012;24:115402.
- [30] Tanwar K, Anjum F, Shukla AK, Maiti T. Role of structural distortion on thermoelectric aspects of heavily Sr²⁺ doped GdMnO₃. *Journal of Applied Physics* 2018;124:094902.
- [31] Pal A, Sekhar CD, Venimadhav A, Murugavel P. Tailoring of magnetic orderings in Fe substituted GdMnO₃ bulk samples towards room temperature. *Journal of Physics: Condensed Matter* 2017;29:405803.
- [32] Kimura T, Lawes G, Goto T, Tokura Y, Ramirez A. Magnetoelectric phase diagrams of orthorhombic R MnO₃ (R= Gd, Tb, and Dy). *Physical Review B* 2005;71:224425.
- [33] Zukrowski J, Wasniowska M, Tarnawski Z, Przewoznik J, Chmista J, Kozłowski A, et al. Magnetic Properties of GdMnO₃ and Gd_{0.67}Ca_{0.33}MnO₃ Compounds. *Acta Physica Polonica B* 2003;34:1533.
- [34] Dai H, Liu H, Peng K, Ye F, Li T, Chen J, et al. Effect of barium doping on the microstructure, dielectric and magnetic properties of GdMnO₃ multiferroic ceramics. *Journal of Materials Science: Materials in Electronics* 2019;30:2523-9.
- [35] Ibrahim FM, Eldin J, Mergen A, İlhan SAHİN E, S Basheer H. The Effect of Europium Doping on the Structural and Magnetic Properties of GdMnO₃ Multiferroic Ceramics. *Advanced Ceramics Progress* 2017;3:1-5.
- [36] Zhang Y, Li J, Zhang Z, Liu F, Zhao X, Liu X. Negative magnetism in perovskite manganites Gd_{1-x}Sr_xMnO₃ (0.1 ≤ x ≤ 0.3). *Chemical Research in Chinese Universities* 2015;31:699-703.
- [37] Hemberger J, Lobina S, Von Nidda H-AK, Tristan N, Ivanov VY, Mukhin A, et al. Complex interplay of 3 d and 4 f magnetism in La_{1-x}Gd_xMnO₃. *Physical Review B* 2004;70:024414.
- [38] Biswas S, Khan MH, Pal S, Bose E. The effects of Mn substitution on magnetization reversal properties in Gd_{0.7}Ca_{0.3}MnO₃. *Journal of Superconductivity and Novel Magnetism* 2014;27:463-8.
- [39] Negi P, Dixit G, Agrawal H, Srivastava R. Structural, optical and magnetic properties of multiferroic GdMnO₃ nanoparticles. *Journal of superconductivity and novel magnetism* 2013;26:1611-5.
- [40] Tobe K, Kimura T, Okimoto Y, Tokura Y. Anisotropic optical spectra in a detwinned LaMnO₃ crystal. *Physical Review B* 2001;64:184421.
- [41] Kovaleva N, Boris A, Bernhard C, Kulakov A, Pimenov A, Balbashov A, et al. Spin-Controlled Mott-Hubbard Bands in L a M n O 3 Probed by Optical Ellipsometry. *Physical review letters* 2004;93:147204.

- [42] Perebeinos V, Allen PB. Franck-Condon–Broadened Angle-Resolved Photoemission Spectra Predicted in LaMnO_3 . *Physical review letters* 2000;85:5178.
- [43] Kim M, Murugavel P, Parashar S, Lee J, Noh T. Origin of the 2 eV peak in optical absorption spectra of LaMnO_3 : an explanation based on the orbitally degenerate Hubbard model. *New Journal of Physics* 2004;6:156.
- [44] Kim M, Jung J, Kim K, Lee H, Yu J, Noh T, et al. Spin-orbital pattern dependent polaron absorption in manganites. *Physical review letters* 2002;89:016403.
- [45] Jung J, Kim K, Eom D, Noh T, Choi E, Yu J, et al. Determination of electronic band structures of CaMnO_3 and LaMnO_3 using optical-conductivity analyses. *Physical Review B* 1997;55:15489.
- [46] Rusydi A, Rauer R, Neuber G, Bastjan M, Mahns I, Müller S, et al. Metal-insulator transition in manganites: changes in optical conductivity up to 22 eV. *Physical Review B* 2008;78:125110.
- [47] Bebenin N, Loshkareva N, Makhnev A, Mostovshchikova E, Nomerovannaya L, Gan'shina E, et al. Optical and magneto-optical properties of ferromagnetic $\text{La}_{1-x}\text{Ba}_x\text{MnO}_3$ single crystals. *Journal of Physics: Condensed Matter* 2010;22:096003.
- [48] Arai T, Adachi S. Excited states of 3d³ electrons in K_2SiF_6 : Mn^{4+} red phosphor studied by photoluminescence excitation spectroscopy. *Japanese Journal of Applied Physics* 2011;50:092401.
- [49] Shaterian M, Enhessari M, Rabbani D, Asghari M, Salavati-Niasari M. Synthesis, characterization and photocatalytic activity of LaMnO_3 nanoparticles. *Applied Surface Science* 2014;318:213-7.
- [50] Das N, Bhattacharya D, Sen A, Maiti HS. Sonochemical synthesis of LaMnO_3 nanopowder. *Ceramics International* 2009;35:21-4.
- [51] Feng CH, Li QS, Liu CM, Deng Y, Guo L. Synthesis of perovskite-type LaMnO_3 under hydrothermal conditions. *Materials Science Forum: Trans Tech Publ*; 2005. p. 4051-4.
- [52] Wdowik UD, Ouladdiaf B, Chatterji T. Structural and thermal properties of LaMnO_3 from neutron diffraction and first principles studies. *Journal of Physics: Condensed Matter* 2011;23:245402.
- [53] Supelano GI, Barón-González AJ, Santos AS, Ortíz C, Gómez JAM, Vargas CAP. Effect of Mg addition on LaMnO_3 ceramic system. *Journal of materials research and technology* 2018;7:77-81.
- [54] Nagabhushana B, Chandrappa G, Chakradhar RS, Ramesh K, Shivakumara C. Synthesis, structural and transport properties of nanocrystalline $\text{La}_{1-x}\text{Ba}_x\text{MnO}_3$ ($0.0 \leq x \leq 0.3$) powders. *Solid state communications* 2005;136:427-32.

- [55] Nam NH, Huong DTM, Luong NH. Synthesis and Magnetic Properties of Perovskite $\text{La}_{1-x}\text{Sr}_x\text{MnO}_3$ Nanoparticles. IEEE Transactions on Magnetics 2014;50:1-4.
- [56] Deisenhofer J, Paraskevopoulos M, von Nidda H-AK, Loidl A. Interplay of superexchange and orbital degeneracy in Cr-doped LaMnO_3 . Physical Review B 2002;66:054414.
- [57] Das S, Poddar A, Roy B, Giri S. Studies of transport and magnetic properties of Ce-doped LaMnO_3 . Journal of alloys and compounds 2004;365:94-101.
- [58] Gönen ZS, Gopalakrishnan J, Sirchio SA, Eichhorn B, Smolyaninova V, Greene RL. Lithium Substitution in LaMnO_3 : Synthesis, Structure, and Properties of $\text{LaMn}_{1-x}\text{Li}_x\text{O}_3$ Perovskites. Journal of Solid State Chemistry 2001;159:68-71.
- [59] Hébert S, Martin C, Maignan A, Retoux R, Hervieu M, Nguyen N, et al. Induced ferromagnetism in LaMnO_3 by Mn-site substitution: The major role of Mn mixed valency. Physical Review B 2002;65:104420.
- [60] Ritter C, Ibarra M, De Teresa J, Algarabel P, Marquina C, Blasco J, et al. Influence of oxygen content on the structural, magnetotransport, and magnetic properties of $\text{LaMnO}_{3+\delta}$. Physical Review B 1997;56:8902.
- [61] Trokiner A, Verkhovskii S, Gerashenko A, Volkova Z, Anikeenok O, Mikhalev K, et al. Melting of the orbital order in LaMnO_3 probed by NMR. Physical Review B 2013;87:125142.
- [62] Nohara Y, Yamasaki A, Kobayashi S, Fujiwara T. Electronic structure of antiferromagnetic LaMnO_3 and the effects of charge polarization. Physical Review B 2006;74:064417.
- [63] Alonso J, Martinez-Lope M, Casais M, Munoz A. Magnetic structures of $\text{LaMnO}_{3+\delta}$ perovskites ($\delta = 0.11, 0.15, 0.26$). Solid state communications 1997;102:7-12.
- [64] Phan T-L, Thanh P, Yen P, Zhang P, Thanh T, Yu S. Ferromagnetic short-range order and magnetocaloric effect in Fe-doped LaMnO_3 . Solid State Communications 2013;167:49-53.
- [65] Branković G, Đuriš K, Jagličić Z, Jagodič M, Branković Z. Magnetic properties of pure and Ca and Sr doped LaMnO_3 prepared by polymerisable complex method. Advances in Applied Ceramics 2009;108:267-72.
- [66] De K, Ray R, Panda RN, Giri S, Nakamura H, Kohara T. The effect of Fe substitution on magnetic and transport properties of LaMnO_3 . Journal of magnetism and magnetic materials 2005;288:339-46.
- [67] Kumar A, Yusuf S. The phenomenon of negative magnetization and its implications. Physics Reports 2015;556:1-34.

- [68] Menyuk N, Dwight K, Wickham D. Magnetization reversal and asymmetry in cobalt vanadate (IV). *Physical Review Letters* 1960;4:119.
- [69] Abe M, Kawachi M, Nomura S. Compensation temperature of spontaneous magnetization in spinel Fe_2MoO_4 . *Journal of the Physical Society of Japan* 1971;31:940-.
- [70] Belov K, Goryaga A, TY G. Anomalies of Coersive force near compension temperature in ferrite spinel,. *Fizika Tverogo tela* 1972;14:1428.
- [71] Padam R, Pandya S, Ravi S, Grover A, Pal D. Exchange bias effect in $\text{Co}(\text{Cr}_{0.925}\text{Fe}_{0.075})_2\text{O}_4$. *AIP Conference Proceedings: AIP*; 2013. p. 1112-3.
- [72] Zhang Hg, Wang Wh, Liu Ek, Tang Xd, Li Gj, Zhang Hw, et al. Compensation effect and magnetostriction in $\text{CoCr}_{2-x}\text{Fe}_x\text{O}_4$. *physica status solidi (b)* 2013;250:1287-92.
- [73] Zhaorong Y, Shun T, Yuheng Z. Temperature-induced magnetization reversal in $\text{FeCr}_{2-x}\text{Al}_x\text{S}_4$. *Journal of Physics: Condensed Matter* 2003;15:7411.
- [74] Tolpygo S, Mikhailov I, Morozovsky A, Yushchenko S, Ryabchenko S. Unusual magnetic behavior of $\text{La}_{1-x}\text{Ca}_x\text{CoO}_{3-y}$. *Physica C: Superconductivity* 1991;185:1097-8.
- [75] Ang R, Sun Y, Ma Y, Zhao B, Zhu X, Song W. Diamagnetism, transport, magnetothermoelectric power, and magnetothermal conductivity in electron-doped $\text{CaMn}_{1-x}\text{V}_x\text{O}_3$ manganites. *Journal of applied physics* 2006;100:063902.
- [76] Fujiwara T, Matsukawa M, Ohuchi S, Kobayashi S, Nimori S, Suryanarayanan R. Magnetization reversal and chemical pressure effect in the electron-doped manganite $\text{CaMn}_{0.95}\text{Sb}_{0.05}\text{O}_3$. *Journal of the Korean Physical Society* 2013;62:1925-8.
- [77] Murano Y, Matsukawa M, Ohuchi S, Kobayashi S, Nimori S, Suryanarayanan R, et al. Effect of pressure on the magnetic, transport, and thermal-transport properties of the electron-doped manganite $\text{CaMn}_{1-x}\text{Sb}_x\text{O}_3$. *Physical Review B* 2011;83:054437.
- [78] Jeffery G. *Elements of x-ray diffraction* (Cullity, BD). ACS Publications; 1957.
- [79] Foner S. Versatile and sensitive vibrating-sample magnetometer. *Review of Scientific Instruments* 1959;30:548-57.
- [80] Wagh AA, Suresh K, Kumar PA, Elizabeth S. Low temperature giant magnetocaloric effect in multiferroic GdMnO_3 single crystals. *Journal of Physics D: Applied Physics* 2015;48:135001.
- [81] Doerr M, Loewenhaupt M, Wagh AA, Kumar PA, Elizabeth S, Roessler S, et al. Interplay of structural distortions, dielectric effects and magnetic order in multiferroic GdMnO_3 . *Journal of the Korean Physical Society* 2013;62:1449-52.
- [82] Romaguera-Barcelay Y, Moreira JA, Almeida A, Araújo J, de la Cruz JP. Dimensional effects on the structure and magnetic properties of GdMnO_3 thin films. *Materials Letters* 2012;70:167-70.

- [83] Mahana S, Manju U, Topwal D. Giant magnetocaloric effect in GdAlO_3 and a comparative study with GdMnO_3 . *J Phys D Appl Phys* 2017;50:035002.
- [84] Nandy A, Pradhan S. Effects of monovalent cation doping on the structure, microstructure, lattice distortion and magnetic behavior of single crystalline NdMnO_3 compounds. *Dalton Transactions* 2015;44:17229-40.
- [85] Sultan K, Ikram M, Asokan K. Effect of Mn doping on structural, morphological and dielectric properties of EuFeO_3 ceramics. *RSC Advances* 2015;5:93867-76.
- [86] Rao C, Arulraj A, Cheetham A, Raveau B. Charge ordering in the rare earth manganates: the experimental situation. *Journal of Physics: Condensed Matter* 2000;12:R83.
- [87] Tiwari P, Rath C. Evolution of structure and magnetic properties of stoichiometry and oxygen rich LaMnO_3 nanoparticles. *Journal of Magnetism and Magnetic Materials* 2017;441:635-41.
- [88] Yadagiri K, Nithya R. Structural and micro-Raman studies of DyMnO_3 with potassium substitution at the Dy site. *RSC Advances* 2016;6:95417-24.
- [89] Ferreira W, Moreira JA, Almeida A, Chaves M, Araújo J, Oliveira J, et al. Spin-phonon coupling and magnetoelectric properties: EuMnO_3 versus GdMnO_3 . *Physical Review B* 2009;79:054303.
- [90] Mihalik M, Mihalik M, Fitta M, Bałanda M, Vavra M, Gabáni S, et al. Magnetic properties of $\text{NdMn}_{1-x}\text{Fe}_x\text{O}_{3+\delta}$ ($0 \leq x \leq 0.3$) system. *Journal of Magnetism and Magnetic Materials* 2013;345:125-33.
- [91] Jin-Ling J, Xiang-Qun Z, Guo-Ke L, Zhao-Hua C. Influence of the Jahn—Teller distortion on magnetic ordering in $\text{TbMn}_{1-x}\text{Fe}_x\text{O}_3$. *Chinese Physics B* 2012;21:107501.
- [92] Hong F, Cheng Z, Zhao H, Kimura H, Wang X. Continuously tunable magnetic phase transitions in the $\text{DyMn}_{1-x}\text{Fe}_x\text{O}_3$ system. *Applied physics letters* 2011;99:092502.
- [93] Ivetić TB, Tadić M, Jagodić M, Gyergyek S, Štrbac G, Lukić-Petrović SR. Structure and magnetic properties of $\text{Co}_3\text{O}_4/\text{SiO}_2$ nanocomposite synthesized using combustion assisted sol-gel method. *Ceramics International* 2016;42:18312-7.
- [94] Tadić M, Kusigerski V, Marković D, Panjan M, Milošević I, Spasojević V. Highly crystalline superparamagnetic iron oxide nanoparticles (SPION) in a silica matrix. *Journal of Alloys and Compounds* 2012;525:28-33.
- [95] Huang X, Ding J, Jiang Z, Yin Y, Yu Q, Li X. Dynamic properties of cluster glass in $\text{La}_{0.25}\text{Ca}_{0.75}\text{MnO}_3$ nanoparticles. *Journal of Applied Physics* 2009;106:083904.
- [96] Tadic M, Kralj S, Jagodic M, Hanzel D, Makovec D. Magnetic properties of novel superparamagnetic iron oxide nanoclusters and their peculiarity under annealing treatment. *Applied Surface Science* 2014;322:255-64.

- [97] Kumar V, Kumar R, Singh K, Arora S, Shvets I, Kumar R. Evidence for spin glass state of $\text{NdCo}_{1-x}\text{Ni}_x\text{O}_3$ ($x= 0.3- 0.5$). *Journal of Applied Physics* 2014;116:073903.
- [98] Nandy A, Roychowdhury A, Das D, Pradhan S. Structural and magnetic characterizations of undoped and K-doped NdMnO_3 single crystals synthesized by sol-gel route: A comparative study. *Powder technology* 2014;254:538-47.
- [99] Iliev M, Abrashev M, Laverdiere J, Jandl S, Gospodinov M, Wang Y-Q, et al. Distortion-dependent Raman spectra and mode mixing in R MnO_3 perovskites ($\text{R}= \text{La, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Y}$). *Physical Review B* 2006;73:064302.
- [100] Moreira ML, Paris EC, do Nascimento GS, Longo VM, Sambrano JR, Mastelaro VR, et al. Structural and optical properties of CaTiO_3 perovskite-based materials obtained by microwave-assisted hydrothermal synthesis: An experimental and theoretical insight. *Acta Materialia* 2009;57:5174-85.
- [101] Sun Q, Wang S, Devakumar B, Li B, Sun L, Liang J, et al. Synthesis and photoluminescence properties of novel far-red-emitting $\text{BaLaMgNbO}_6: \text{Mn}^{4+}$ phosphors for plant growth LEDs. *RSC advances* 2018;8:28538-45.
- [102] Kumar S, Rai S, Rath C. Multifunctional role of dysprosium in HfO_2 : stabilization of the high temperature cubic phase, and magnetic and photoluminescence properties. *Physical Chemistry Chemical Physics* 2017;19:18957-67.
- [103] Kanamori J. Superexchange interaction and symmetry properties of electron orbitals. *Journal of Physics and Chemistry of Solids* 1959;10:87-98.
- [104] Kumar A, Sanger A, Singh AK, Kumar A, Kumar M, Chandra R. Experimental evidence of spin glass and exchange bias behavior in sputtered grown $\alpha\text{-MnO}_2$ nanorods. *Journal of Magnetism and Magnetic Materials* 2017;433:227-33.
- [105] Tiwari P, Kumar S, Rath C. Structural and magnetic phase transitions along with optical properties in $\text{GdMn}_{1-x}\text{Fe}_x\text{O}_3$ perovskite. *Journal of Applied Physics* 2019;126:045102.
- [106] Merten S, Bruchmann-Bamberg V, Damaschke B, Samwer K, Moshnyaga V. Jahn-Teller reconstructed surface of the doped manganites shown by means of surface-enhanced Raman spectroscopy. *Physical Review Materials* 2019;3:060401.
- [107] Brik M, Srivastava A. On the optical properties of the Mn^{4+} ion in solids. *Journal of Luminescence* 2013;133:69-72.
- [108] Vijayanandhini K, Simon C, Pralong V, Bréard Y, Caignaert V, Raveau B, et al. Zero magnetization in a disordered $(\text{La}_{1-x/2}\text{Bi}_{x/2})(\text{Fe}_{0.5}\text{Cr}_{0.5})\text{O}_3$ uncompensated weak ferromagnet. *Journal of Physics: Condensed Matter* 2009;21:486002.
- [109] Dasari N, Mandal P, Sundaresan A, Vidhyadhira N. Weak ferromagnetism and magnetization reversal in $\text{YFe}_{1-x}\text{Cr}_x\text{O}_3$. *EPL (Europhysics Letters)* 2012;99:17008.

- [110] Mahajan A, Johnston D, Torgeson D, Borsa F. Magnetic properties of LaVO_3 . *Physical Review B* 1992;46:10966.
- [111] Kumar S, Coondoo I, Vasundhara M, Patra AK, Kholkin AL, Panwar N. Magnetization reversal behavior and magnetocaloric effect in $\text{SmCr}_{0.85}\text{Mn}_{0.15}\text{O}_3$ chromites. *Journal of Applied Physics* 2017;121:043907.
- [112] Biswas S, Khan MH, Pal S, Bose E. Evolution of magnetic properties in Cr doped manganites $\text{Gd}_{0.7}\text{Ca}_{0.3}\text{Mn}_{1-x}\text{Cr}_x\text{O}_3$ ($x= 0.0-0.5$). *Journal of Magnetism and Magnetic Materials* 2013;328:31-4.
- [113] Mao J, Sui Y, Zhang X, Su Y, Wang X, Liu Z, et al. Temperature-and magnetic-field-induced magnetization reversal in perovskite $\text{YFe}_{0.5}\text{Cr}_{0.5}\text{O}_3$. *Applied Physics Letters* 2011;98:192510.
- [114] Hernández E, Sagredo V, Delgado G. Synthesis and magnetic characterization of LaMnO_3 nanoparticles. *Revista mexicana de física* 2015;61:166-9.
- [115] Terashita H, Neumeier J. Bulk magnetic properties of $\text{La}_{1-x}\text{Ca}_x\text{MnO}_3$ ($0 \leq x \leq 0.14$): Signatures of local ferromagnetic order. *Physical Review B* 2005;71:134402.
- [116] Ghosh B, Siruguri V, Raychaudhuri A, Chatterji T. Effect of size reduction on the structural and magnetic order in $\text{LaMnO}_3 + \delta$ ($\delta \approx 0.03$) nanocrystals: a neutron diffraction study. *Journal of Physics: Condensed Matter* 2013;26:025603.
- [117] Karmakar A, Majumdar S, Giri S. Orthorhombic distortion and novel magnetic phase separation in $\text{Pr}_{0.5}\text{Eu}_{0.5}\text{MnO}_3$. *Journal of Applied Physics* 2011;110:063914.
- [118] Mohanty P, Kabiraj D, Mandal R, Kulriya P, Sinha A, Rath C. Evidence of room temperature ferromagnetism in argon/oxygen annealed TiO_2 thin films deposited by electron beam evaporation technique. *Journal of Magnetism and Magnetic Materials* 2014;355:240-5.
- [119] Branković Z, Đuriš K, Radojković A, Bernik S, Jagličić Z, Jagodič M, et al. Magnetic properties of doped LaMnO_3 ceramics obtained by a polymerizable complex method. *Journal of sol-gel science and technology* 2010;55:311-6.
- [120] Markovich V, Fita I, Mogilyansky D, Wisniewski A, Puzniak R, Titelman L, et al. Effect of particle size on magnetic properties of $\text{LaMnO}_3 + \delta$ nanoparticles. *Superlattices and Microstructures* 2008;44:476-82.
- [121] Kumar D, Galivarapu J, Banerjee A, Nemkovski K, Su Y, Rath C. Size-dependent magnetic transitions in $\text{CoFe}_{0.1}\text{Cr}_{0.9}\text{O}_4$ nanoparticles studied by magnetic and neutron-polarization analysis. *Nanotechnology* 2016;27:175702.
- [122] Mukherjee S, Ranganathan R, Anilkumar P, Joy P. Static and dynamic response of cluster glass in $\text{La}_{0.5}\text{Sr}_{0.5}\text{CoO}_3$. *Physical Review B* 1996;54:9267.

- [123] Kumar D, Banerjee A. Coexistence of interacting ferromagnetic clusters and small antiferromagnetic clusters in $\text{La}_{0.5}\text{Ba}_{0.5}\text{CoO}_3$. *Journal of Physics: Condensed Matter* 2013;25:216005.
- [124] Deac I, Mitchell J, Schiffer P. Phase separation and low-field bulk magnetic properties of $\text{Pr}_{0.7}\text{Ca}_{0.3}\text{MnO}_3$. *Physical Review B* 2001;63:172408.
- [125] Knobel M, Nunes W, Socolovsky L, De Biasi E, Vargas J, Denardin J. Superparamagnetism and other magnetic features in granular materials: a review on ideal and real systems. *Journal of nanoscience and nanotechnology* 2008;8:2836-57.
- [126] Pramanik A, Banerjee A. Interparticle interaction and crossover in critical lines on field-temperature plane in $\text{Pr}_{0.5}\text{Sr}_{0.5}\text{MnO}_3$ nanoparticles. *Physical Review B* 2010;82:094402.
- [127] Calleja FB, Fakirov S. *Microhardness of polymers*: Cambridge University Press; 2007.