

Mohindar Singh Seehra
Eberly Distinguished Professor Emeritus
Department of Physics & Astronomy, West Virginia University
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A. EDUCATION:

8/1955 - 6/1959 R. K. Arya College, Nawanshahr, Punjab University, India. B.Sc.
8/1960 - 7/1962 Aligarh University, India, M.Sc. (Physics)- Top Rank (medalist)
9/1963 - 6/1969 University of Rochester, NY, Ph.D. (Physics); (Advisor: Prof. T. G. Castner)

B. PROFESSIONAL POSITIONS:

8/16/2016- Eberly Distinguished Professor Emeritus
5/2008- 8/2016 Research Professor/Eberly Professor Emeritus, West Virginia University.
1/1992 - 5 /2008 Eberly Distinguished Professor of Physics, West Virginia University.
8/1977 - 12/1991 Professor of Physics, West Virginia University.
8/1973 - 8/1977 Associate Professor of Physics, West Virginia University
8/1969 - 8 /1973 Assistant Professor of Physics, West Virginia University
8/1962 -7/1963 Lecturer in Physics, Jain College, Ambala, India
8/1959 -8/1960 Laboratory Instructor in Chemistry, Arya College, Nawanshahr, India

C. AWARDS AND HONORS:

1. Inducted into the WV Order of Vandalia on June 7, 2019 for “Distinguished Service to West Virginia University”.
2. 2015 Mary Catherine Buswell Award, West Virginia University, “for advancement of women at West Virginia University and for service to the Community”.
3. Selected as an ‘Outstanding Referee’ in 2010 by the American Physical Society (APS) for service as a referee of the manuscripts submitted to the journals published by the APS;
4. Selected as a Fellow of the American Physical Society in 1984 “for experimental contributions to improved understanding of magnetic and dielectric materials”.
5. Selected as a Fellow of the Institute of Physics (UK) 2001-
6. Alfred P. Sloan Foundation Research Fellow, 1973-76.
7. Albert Nelson Marquis Lifetime Achievement Award, Marquis Who's Who in America, 2017.
8. Eberly Family Distinguished Professor of Physics, West Virginia University, 1992—
9. "Outstanding Researcher of the College of Arts and Sciences at West Virginia University" in 1985
10. Oak Ridge Associated Universities Summer Fellow during 1976, 1977, 1984 and 1985.

D. Research Focus: Magnetism of transition metal oxides, sulfides, fluorides, spinels, and perovskites; Magnetism in lower dimensions(2-D and 1-D); Size and surface effects in magnetic nanostructures; Carbon-based materials(graphites, C₆₀, graphene, coals, cellulose); Applications of nanostructures in catalysis and biomedicine.

E. Books Edited

1. **Magnetic Spinel- Synthesis, Properties and Applications**, edited by M.S. Seehra (314 pages, InTech Publishers, London, UK, March 2017) ISBN: 978-953-51-2974-5; Print ISBN: 978- 953-51-2973-8.
2. **Nanostructured Materials: Fabrication to Applications**, edited by M. S. Seehra (222 pages, InTech Publishers, London, UK, July 2017). ISBN: 978-953-51-3372-8; Print ISBN: 978-953-51-3371-1.
3. **Noble and Precious Metals- Properties, Nanoscale Effects and Applications**, Edited by M. S. Seehra and A.D. Bristow (432 pages, InTech Publishers, London, United Kingdom, July 2018) Online ISBN:978-1-78923-293-6; Print ISBN:978-1-78923-292-9.

F. Endowments Established at West Virginia University

1. **Dr. Mohindar S. and Harbhajan K. Seehra Library Endowment for Physics (established 1999):** this endowment is used to acquire physics related books for the WVU library.
2. **Dr. Mohindar S. Seehra Research Award (established 2011):** Income from this endowment is used to provide annual monetary awards to one/two Ph.D. students in Physics & Astronomy at WVU who have published high quality research papers in prominent peer-reviewed journals. Selection of the students is made by a department committee.
3. **Dr. Mohindar Singh Seehra Lecture Fund (established 2016):** Income from this endowment is used to host a renowned guest speaker annually on topics related to balancing professional career with family life for women in the workplace. The lecturer is selected/hosted by the WVU Center for Women Studies in consultation with WVU Council for Women's Concerns.

G. PROFESSIONAL SERVICE:

At WVU, I served on numerous committees at the department, college, and university levels.

I review several proposals every year for agencies such as the National Science Foundation and the Department of Energy. I have also reviewed local proposals from the Energy Research Center and the Senate Research Committee.

I am a referee for several journals reviewing about twenty papers per year. I have reviewed papers for the Physical Review, Physical Review Letters, Physics Letters, Materials Letters, Journal of Physics and Chemistry of Solids, Journal of Applied Physics, Journal of Magnetism and Magnetic Material, Journal of Solid State Chemistry, Fuel, J. Phys. Condens. Matter; J. Phys. D: Applied Physics, J. Material Research, Fuel Processing Technology, Journal of Alloys and Compounds, Solid State Communications, Carbon, Physica, Applied Physics Letters, and Physics Status Solidi.

External Reviewer for Ph.D. dissertations in various universities in India such as: Indian Institute of Technology, Madras; Calcutta University; Indian Institute of Technology, Kanpur; University of Hyderabad; Aligarh University; Indian Institute of Technology, Roorkee; and Indian Institute of Science, Bangalore and Indian Institute of Technology, Guwahati.

H. Research Supervision and Training of Students and Postdocs

M.S. THESIS SUPERVISED:

1. 1972, E. E. Bragg - Temperature Dependence of the Magnetic Susceptibility of MnF_2
2. 1972, R. A. Rendina - Electrical Resistivity of Cr-Mn Alloys
3. 1974, V. L. Capan - Electrical Resistivity of Fe and FeCo Alloys
4. 1975, G. W. Diver - Magnetic Susceptibility of CoO
5. 1976, G. E. Hammer - Magnetic Susceptibility and Magnetic Transition in MnO
6. 1976, P. S. Silinsky - Alpha-Gamma and Order-Disorder Transitions in FeCo
7. 1978, D. E. Husk - Dielectric Properties of Iron Pyrite
8. 1978, W. B. Parker - Temperature Dependent Resistivity of FeS_2
9. 1980, R. E. Helmick - Temperature Dependence of the Dielectric Properties of MnO
10. 1982, R. D. Groves - Shifts in the Optical Absorption Transitions of MnO near T_N
11. 1982, R. Jayaram - Low Frequency Dielectric Properties of CoO near the Néel Temperature
12. 1983, K. Nitsopoulou - Search for Anisotropy in the EPR Spectra of MnO
13. 1984, D. M. George - Optical Absorption Study of 250 K Transition of BaMnF_4
14. 1984, S. Arhunmwunde - Analysis of Molecular Field Theory of Magnetic Susceptibilities
15. 1987, L. Cheng - Theory of Photoacoustic Spectroscopy and Spectra of Quartz
16. 1987, S. Mullins - A High Temperature ESR Cavity System and Coal Pyrolysis Studies
17. 1988, J. C. Dean - Magnetic Studies of Co^{2+} and Fe^{2+} ions in MgO
18. 1988, B. Gordon - Magnetic Susceptibility of Monomers and Dimers of Mn^{2+} ions in MgO
19. 1989, Z. Feng - Magnetic Properties of Cupric Oxide
20. 1990, John Coletti - Structural and Magnetic Properties of Mn-doped $\square$ -TiAl Alloys
21. 2000, Paromita Roy - Magnetic Properties of Silica Doped Ferrihydrite Nanoparticles
22. 2000, Heidi Magnone - Synthesis and Characterization of Metal Oxide Nanoparticles
23. 2004, Latha Ramakrishnan: Electrochemical Detection of Mercury using Boron-Doped Diamond Electrodes.

24. 2005, Aashish Kalra: Microwave Dewatering of fine coal slurries.
25. 2007, Sukanya Ranganathan: Carbon assisted electrolysis of water to produce hydrogen at room temperature.
26. 2008, Shilpa Bollineni: Hydrogen production via carbon- assisted water electrolysis at room temperature: Effects of catalysts and carbon type.
27. 2010, Savan Suri: Synthesis, structural and magnetic properties of copper-doped cerium oxide nanoparticles.
28. 2011, L. P. Akkineni: Hydrothermal pretreatment of biomass samples for producing energy efficient hydrogen electrochemically.
29. 2013, Sai Kishore Pyapalli: Phase transformations of microcrystalline cellulose under ball-milling and hydrothermal treatment.

PH.D. DISSERTATIONS SUPERVISED:

1. 1971, R. P. Gupta: Temperature Dependence of the EPR Linewidth in RbMnF_3 , KMnF_3 , and Mg Doped KMnF_3
2. 1974, E. E. Bragg: The Vibrating Sample Magnetometer and the Magnetic Susceptibility of MnF_2 , RbMnF_3 and MnO
3. 1981, S. C. Kondal - Magnetic Resonance and Magnetostatic Modes in EuS
4. 1982, P. S. Silinsky - Non-Stoichiometry and Temperature Dependent Magnetic Susceptibilities in CoO
5. 1985, S. A. Abumansoor - Antiferromagnetic Ordering Effect on the Optical Transitions in MnF_2
6. 1987, R. Kannan - Magnetic Properties of Randomly Diluted Antiferromagnetic System: CoMgO
7. 1988, S. Darwish- Two-Exciton and Exciton-Magnon Bands in Mn^{2+} Magnets
8. 1991 - Feng Zhen - Magnetic Properties of $\text{Ni}_p\text{Mg}_{1-p}\text{O}$ System
9. 2006- Jenny Shim - Size Effects in the Magnetic Properties of NiO nanoparticles
10. 2009- Vivek Singh- Size Dependent Magnetic Properties of Nickel Nanoparticles embedded in silica matrix
11. 2011- James Rall- Nanosize Effects in the Magnetic Properties of Two Layered Hydroxides of Nickel.
12. 2015- Vishal Narang- Erbium Alloyed Aluminum Nitride thin films: Structural, piezoelectric and magnetic properties. Currently Research Associate at CUNY, NY

13. 2015- Kelly Pisane- Effect of size and size distribution on the magnetic properties of maghemite nanoparticles and core-shell iron-platinum nanoparticles. Initially employed as scientist at Nokomis Inc; Now working in Big Data Analyst at Booking. Com (Amsterdam, Netherlands).
14. 2016- Zhengjun Wang- Investigations into the nature of magnetism in transition-metal phthalocyanines; Initially employed as a Research Associate at Georgia Institute of Technology; Now employed at Intel Corp.

CURRENT STUDENTS:

Although I am officially retired now, I am still mentoring several Ph.D. students. Recent advisees include Sobhit Singh who is now a postdoc at Rutgers, Navid Mottaghi and Mina Aziziha at WVU, and some students at other universities (University of Connecticut and IIT, Guwahati, India). This is done at the request of the students in consultation with their Ph.D. advisors. My role in this capacity has been to assist these students in the interpretation of their data and in preparing the manuscripts for publication.

POSTDOCTORAL RESEARCH ASSOCIATES:

1. 1971-1972. R. P. Gupta, now retired from an aerospace company after many years of service
2. 1976-77 Paul S. Burgardt, joined Rockwell International
3. 1977-78. W. W. Kou, joined U.S. Naval Research
4. 1978 S. S. Seehra, with Lockheed/Martin (now retired)
5. 1979-81. Jagadeesh Moodera, Now Senior Research Professor at Magnet Lab., M.I.T., (Cambridge)
6. 1981-82. G. S. Chaddha, Chairman, Physics Department, Punjab Agricultural Society, India (now retired).
7. 1981-84 G. S. Srinivasan, Now Professor of Physics, Oakland University, Michigan
8. 1984. T. T. Srinivasan, joined as a research associate at Penn State Univ.
9. 1985-87 Bikas Ghosh, now an Associate Professor at a Calcutta Univ. in India
10. 1986-89. Gopalakrishnan Thevar, Joined Brigham Young University in July 1989
11. 1987-90 P. Raghoottama, joined Vanderbilt University in January, 91, now owns a biomedical business in St. Louis, Missouri.
12. 1987-88 Ali Tatli, Fulbright Scholar from Middle East Technical University in Ankara, Turkey
13. 1988-90. J. Zhao – Worked for a semiconductor company in CA(now retired)
14. 1988-96. M. M. Ibrahim – currently a V.P. for J. P. Morgan Co.
15. 1989-98. Suresh Vennekkat – now working for the IRS

16. 1990-98 Eric Hopkins worked with me as a full-time research associate; now working for the geological survey, West Virginia University.
17. 1996-2005. A. Manivannan, left to become a Program Manager/ Research Scientist at the National Energy Technology Laboratory of U.S. Dept. of Energy, Morgantown, WV.
18. 1999-2002. Alex Punnoose, full Professor of Physics at Boise State University (now deceased).
19. 2003- 2007 Prasant Dutta, senior Research Associate, Anderson Cancer Center, Houston, TX.
20. 2005- 2007. Susmita Pal, was a research associate at the University of South Florida, Tampa, FL; Now working at the Anderson Cancer Center, Houston, TX.
21. 2009- 2012. Vivek Singh, now a Research Associate at the University of Colorado, Boulder, CO.
22. 2015-2016. Vishal Narang, now a Research Associate at CUNY, NY.

I. COURSES TAUGHT AT WEST VIRGINIA UNIVERSITY:

Physics 111, 112 - Engineering Physics

Physics 283 - Thermodynamics for juniors and seniors

Physics 251-252 - Undergraduate Quantum Physics

Physics 231-232 - Undergraduate Classical Mechanics

Physics 124 - Modern Physics for undergraduates

Physics 241 - Modern Lab for juniors and seniors

Physics 271-272 - Introductory Solid State Physics

Physics 301 - Advanced Topics in Phase Transitions for graduate students

Physics 331 - Advanced Classical Mechanics

Physics 351 - Graduate Quantum Mechanics

Physics 371-372 - Intermediate Solid-State Physics

Physics 401 - Special Topics in X-Ray Diffraction (Spring 1999, Fall 2000)

Physics 401 - Special Topics in Magnetism & Magnetic Resonance (Spring 2001)

J. PRESENTATIONS

During my career at WVU, over two hundred presentations have been made by me and various members of my research group at professional meetings such as the Annual March Meeting of the

American Physical Society, Magnetism and Magnetic Materials Conferences, Annual Review meeting of the Consortium for Fossil Fuel Science, and for funding agencies. I have also made some invited presentations at conferences and at other universities, including universities in Netherlands, Spain and in India.

K. RESEARCH GRANTS RECEIVED:

The grants listed below were awarded on the merit of the submitted proposals. The funds were used to defray the costs of doing research including acquisition of equipment, support of graduate students and postdocs, partial support for the summer salary of the PI and costs associated with attending conferences to make presentations of our research results. The dollar amount listed is the actual amount received at that time without adjusting for inflation.

1. 1971, Research Corporation, \$7,000
2. 1972, National Science Foundation, \$13,500
3. 1973, A. P. Sloan Foundation Fellowship, \$22,700
4. 1974, National Science Foundation, \$40,000, two year grant
5. 1976, National Science Foundation, \$45,000, two year grant
6. 1976, Energy Research Center, WVU, \$20,000
7. 1977, Energy Research Center, WVU, \$20,000
8. 1978, National Science Foundation, \$83,300, three year grant
9. U.S. Department of Energy, \$12,000
10. Energy Research Center, \$20,000
11. 1980, U.S. Department of Energy, \$26,909, two year grant
12. 1981, Energy Research Center, \$24,856
13. National Science Foundation, \$90,000, three year grant
14. 1982, Energy Research Center, \$8,000
15. 1984, Energy Research Center, \$26,976
16. 1985, Energy Research Center, \$22,054
17. 1986, National Science Foundation, \$47,000, two year grant
18. U.S. Department of Energy, \$185, 557, three year grant
19. U.S. Bureau of Mines, \$77,841
20. 1986, U.S. Department of Energy, \$20,500
21. 1987, U.S. Department of Energy, \$20,324
22. U.S. Bureau of Mines, \$66,004
23. State of WV, special equipment funds, \$37,000
24. Energy Research Center, \$2,400
25. 1988, U.S. Bureau of Mines, \$64,000
26. 1988 U.S. Department of Energy/CFFLS, \$50,000
27. 1988, DARPA/CERC (with Pavlovic, Cooper, Dalal), \$276,000
28. Energy Research Center, \$27,000 (with M. Chaudhry)

29. 1989, DARPA/CERC, for developing Materials Research Lab, \$550,000
30. 1990, U.S. Bureau of Mines, \$50,000
31. 1990, U.S. Department of Energy/CFFLS, \$62,000
32. 1990, U.S. Department of Energy/Graphite Project, ~\$180,000, three year grant
33. 1990, U.S. Department of Energy through NRCCE, \$55,000 for equipment
34. 1991, U.S. Bureau of Mines, \$50,630
35. 1991, U.S. Department of Energy/CFFLS, \$71,566
36. 1992, U.S. Department of Energy/NRCCE, \$95,000 for equipment
37. CONSOL Inc., \$20,049
38. U.S. Bureau of Mines, \$51,887
39. U.S. Department of Energy/CFFLS, \$82,977
40. 1993, U.S. Department of Energy/CFFLS/NRCCE, \$113,614
41. U.S. Bureau of Mines (with M. Gautam of Mech. Engg), \$99,777
42. CERB award/NRCCE, \$26,000
43. NSF/EPSCoR, \$18,850
44. 1994, U.S. Department of Energy/CFFCL/NRCCE, \$128,961
45. U.S. Department of Energy/METC (with F. King of Chemistry), \$61,817
46. NSF/EPSCoR, \$27,970
47. 1995, U.S. Bureau of Mines (with M. Gautam of Mech. Engg), \$99,760
48. U.S. Department of Energy/CFFLS/NRCCE, \$113,700
49. NSF/EPSCOR, \$29,550

50. 1996, U.S. Bureau of Mines on Microwave assisted regeneration of traps, \$30,000.
51. U.S. Dept. of Energy, Pittsburgh Energy Technology Center; Catalysis and Free Radical ESR Spectroscopy - \$119,677 for 1996-97 including some matching by NRCCE.
52. National Sciences Foundation/EPSCoR, for Nickel based superalloys -- \$24,310
53. 1997, U.S. Department of Energy: Catalysis and Free Radical ESR Spectroscopy – \$131,068 for 1997-1998, including some matching by NRCCE.
54. U.S. Bureau of Mines: Microwave assisted regeneration of traps. Project ended September 30, 1997 with about \$30,000 available for 1996-1997.
55. National Sciences Foundation/EPSCoR, for Nickel based superalloys -- \$24,000 for 1997-1998 without indirect costs (waived).
56. 1998, U.S. Department of Energy: Catalysis and Free Radical ESR Spectroscopy □ \$25,000 for 1998-1999; program ended June 1999.
57. National Science Foundation: High temperature structural alloys with Cooper, Chang, Kang and Van Scoy for 1998-2000. My share of 1998-1999 budget is \$96,442.

58. 1999, U.S. Department of Energy: "C-1 Chemistry Program: Analytical Characterization of Catalyst Structure and Product Distribution", \$115,695 for the period 4/28/99 to 4/27/00.
59. U.S. Department of Energy: "Particulate Matter Program: Characterization of organic and inorganic components of PM_{2.5}", \$62,511 for the period 7/1/99 to 6/30/00.
60. National Science Foundation: "Industrial Partnership on Structural Alloys" (CoPI) with B. R. Cooper as the PI, \$59,440 for the period 7/1/99 to 6/30/00, including WVU match.
61. 2000: U.S. Department of Energy: C-1 Chemistry Program on Catalyst Characterization, \$115,695 for the period 4/29/00 to 4/28/01.
62. U.S. Department of Energy: Particulate Matter Program, \$45,067 for 7/1/00 to 6/30/01.
63. National Science Foundation: Equipment grant of \$196,500 for acquiring a Scanning Probe Microscope, with Professor Lederman, Myers and Stinespring.
64. NETL/Department of Energy: Development of electrochemical techniques for mercury detections with A. Manivannan, \$7,400.
65. 2001: U.S. Department of Energy: C-1 Chemistry Program on Catalysis, \$102,000
66. U.S. Air Force Office of Scientific Research (with Lederman and Cooper): My share is \$43,682/year for two years.

Grants for 2002-2016:

67. Air Force Office of Scientific Research – DEPSCoR, "An Integrated Methodology for three-dimensional visualization of subsurface microcracks", with Lederman, Cooper, Seehra, Chang and Kang. My share of the budget is \$43,682 per year, for the two year period 6/2001 to 5/2003.
68. U.S. Department of Energy/NETL University Research Program: "Quantification of mercury in flu gas emissions using boron doped diamond", A. Manivannan and M. S. Seehra, \$50,000 for 10/1/01 to 9/30/02. The project ended September 30, 2002.
69. U.S. Environmental Protection Agency/EPSCoR: "Development of electrochemical techniques for the detection/quantification of mercury using boron-doped diamond electrodes, M. S. Seehra, A. Manivannan and R. Smart (Chemistry Dept.), \$410,465 for two years, 10/1/01 to 9/30/04.
70. U.S. Department of Energy, Center for Advanced Separation Technologies: "Development of electrochemical sensors for on-site monitoring of heavy metal ions in coal processing and utilization", A. Manivannan and M. S. Seehra, \$200,219 for two years, 1/1/02 to 12/31/03.
71. U.S. Department of Energy, Consortium for Fossil Fuel Science: "C-1 Chemistry Research for the production of ultra-clean transportation fuels and hydrogen". A new three-year program was funded for the period 10/1/02 to 9/30/05. My project deals with "Analytical Characterization of Catalysts" with a budget of \$112,585 for year I.
72. Air Force Office of Scientific Research: An Integrated Methodology for three-dimensional visualization of subsurface microcracks, Lederman, Cooper, Seehra, Chang and Kang. My budget is \$87,364 for 6/2001 to 5/2004.
73. U.S. Department of Energy: New Strategies for Dewatering of Coals; M. S. Seehra, A. Manivannan

- and M.E. Bachlechner, \$267,963 through 12/31/05. The budget for the Seehra-Manivannan team is \$175,829.
74. “Analytical Characterization of Catalysts” funded by the U.S. Department of Energy (DOE) through the Consortium for Fossil Fuel Science (CFFS) on the “Production of ultra-clean transportation fuels and hydrogen” with budgets of \$112,585 for 10/1/02 to 9/30/03, \$149,167 for 10/1/03 to 9/30/04.
 75. Continuation of project # 74 with a budget of \$138,676 for 10/1/04 to 9/30/05.
 76. A. Manivannan and M.S. Seehra: “Portable sensor for detecting mercury and other heavy metals encountered in coal processing and utilization”, a new two-year project funded by U.S. DOE/CAST. The approved budget for year I (10/1/04 to 9/30/05) is \$127,491.
 77. M. S. Seehra: “Portable sensor for detecting mercury and other heavy metals encountered in coal processing and utilization”. The second year budget for Year II to 10/30/07 is \$123,179. The funding source is DOE/CAST.
 78. M. S. Seehra: “Development of novel technologies for the production and storage of hydrogen from coal”. A new three-year project approved for funding by the U.S. Department of Energy. Budget for year I through 5/31/06 was \$170,000 plus \$33,736 in cost-share provided by NRCCE.
 79. M. S. Seehra and B. S. Kang (PI): “Ductility enhancement of Mo phase by nano-size oxide dispersions.” A new three year (8/1/05 to 7/31/08) project funded by the National Energy Technology Laboratory for \$200,000. However my share is rather small (\$27,813).
 80. M. S. Seehra and B. S. Kang (PI): “In-situ mechanical property measurement and influence of carbon and oxygen on grain boundary strength of Mo alloys.” A three-year project (6/23/05 to 6/30/08) funded by UT-Batelle, with two year funding of \$200,000. My share of this budget is \$35,230.
 81. M. S. Seehra: A gift of \$10,500 (no overhead allowed) was received from DTE Pep Tec Inc. (Canonsburg, PA) to purchase the Rietveld Software Code for the quantitative analysis of x-ray diffraction patterns. We carried out analysis of some of their samples.
 82. M. S. Seehra: “X-ray diffraction analysis of samples”, for NETL; \$6,950 were received from NETL during 2005.
 83. “Production of Military Fuels using C1 Chemistry”, was a new multiyear proposal approved by the U.S. Department of Defense for 2007. This proposal by the five university (WVU, Pittsburgh, Auburn, Utah and Kentucky) Consortium for Fossil Fuel Science has a tentative budget of 1 million per year. My share of the budget for 4 years (10/1/07 to 9/30/11) is \$326,388 dollars. My scientific contribution to this project is in the area of structural/electronic characterization of catalysts and research on elastomers.
 84. “On improving the hydrophobicity of oxidized coals” funded by USDOE for two years (10/1/09 to 9/30/11). My budget for two years is \$276,342.
 85. Unconventional Resources for Shale Gas” USDOE/ NETLwith budget of \$77,491for 10/09 to 1/11.
 86. M. S. Seehra: “Development of novel technologies for the production and storage of hydrogen from coal”; \$532,465 for the period 10/1/07 to 12/31/12 received from DOE.
 87. Zeta Potential Approach to Fine Coal Beneficiation, funded by USDOE @\$136,753 for 10/10-9/13.
 88. Characterization and measurements of cellulose crystallinity, funded by NIOSH/CDC \$46,000 for 9/30/11 to 10/1/2013.
 89. Characterization and measurements of nanomaterial crystallinity and surface chemistry, funded by

NIOSH/CDC, \$72,000 for 4/17/2013 to 9/30/2016.

90. Engineered High Value Carbonaceous Products from Biorefinery By-Products, B. Dawson-Andoh and M. S. Seehra, Funded by the North East Sun Grant Institute of Excellence through the U. S. Department of Agriculture for \$ 118,055 plus \$31,410 in cost-share for the period 7-1-2014 to 9-30-2015. My share of the federal budget is \$62,688.

L. REVIEW PAPERS AND CHAPTERS IN BOOKS:

1. M. S. Seehra and D. L. Huber: Paramagnetic Resonance Linebroadening and Spin Spin Relaxation near Magnetic Critical Points, AIP Conference Proceedings 24, 261-267 (1975).
2. M. S. Seehra: Non-Stoichiometry and Magnetic Properties of MnO, FeO, CoO, and NiO, in "Basic Properties of Binary Oxides" edited by A. Dominquez-Rodriquez, J. Castaing and R. Marquez (Univ. of Sevilla Press, Spain 1984) pages 179-193.
3. M. S. Seehra and H. P. J. Wijn: Book chapter entitled "Magnetic Properties of Binary Oxides of d-Transition Elements" in Magnetic properties of Non-Metallic Inorganic Compounds Based on Transition Elements edited by H. P. J. Wijn, Vol. 27g in the Landolt-Börnstein series (Springer Verlag, 1992) pages 1-86.
4. G. Srinivasan and M. S. Seehra: Book chapter entitled "Magnetic Properties of Amorphous Oxides" published in the book "Magnetic Properties of Non-Metals" Vol. III-27/f3 in the Landolt-Börnstein series (Springer-Verlag) pages 239-319 (1994).
5. M. S. Seehra and M. M. Ibrahim: Invited review entitled "Applications of electron spin resonance spectroscopy to catalysis in direct coal liquefaction" Catalysis Vol. 12 (The Royal Soc. of Chemistry, U.K. 1996) pages 302-320.
6. M. S. Seehra and Vivek Singh : 'Use of microwave heating in coal research and in materials synthesis' published in the book entitled 'Microwave Heating' edited by U. Chandra(Intech Publishers, Croatia, 2011) pages 163-180; ISBN:978-953-307-573-0. As of September 1, 2016 2015, this book chapter has been downloaded by 5430 researchers world-wide, with the current download rate of about 60 per month.
7. M. S. Seehra and V. Narang: Mesoporous carbons for energy-efficient water splitting to produce pure hydrogen at room temperature, book chapter in the recently published (8-25-2016) open- access book entitled "Microporous and Mesoporous Carbons", edited by R. S. Dariani and published by InTech Publishers, ISBN 978-953-51-2582-2.
8. M. S. Seehra and A.D. Bristow, Overview of the properties and applications of noble and Precious metals, Introductory chapter in the book 'Noble and Precious Metals- Properties, Nanoscale Effects and Applications' edited by M. S. Seehra and A.D. Bristow; ISBN: 978-1-78923-292-9 (Intech Publishers, London, UK 2018) pages 3-11.

M. RESEARCH PUBLICATIONS IN PEER-REVIEWED JOURNALS:

1. M.S. Seehra and T.G. Castner: The Paramagnetic Linewidth in Copper Formate Tetrahydrate, Phys. Kondens, Materie 8, 185-200 (1968).

2. M.S. Seehra: New Method for Measuring the Static Magnetic Susceptibility by Paramagnetic Resonance, *Rev. Sci. Instr.* 39, 1044-1047 (1968).
3. M.S. Seehra and T.G. Castner: Antiferromagnetic Resonance in Copper Formate Tetrahydrate, *J. Appl. Phys.* 40, 1240 (1969).
4. M.S. Seehra: Two-Dimensional Magnetic Behavior of Copper Formate Tetrahydrate, *Phys. Lett.* A28, 754-755 (1969).
5. M.S. Seehra and T.G. Castner: Study of the Ordered Magnetic State of Copper Formate Tetrahydrate by Antiferromagnetic Resonance, *Phys. Rev.* B1, 2289-2303 (1970).
6. M.S. Seehra and T.G. Castner: Critical Behavior of the EPR Linewidth in MnF_2 , *Solid State Comm.* 8, 787-790 (1970).
7. R.P. Gupta and M.S. Seehra: Critical Behavior of the Paramagnetic Linewidth in RbMnF_3 , *Phys. Lett.* A33, 347-348 (1970).
8. T.G. Castner and M.S. Seehra: Antisymmetric Exchange and Exchange-Narrowed EPR Linewidths, *Phys. Rev.* B4, 38-45 (1971).
9. M.S. Seehra: Frequency Dependence of the EPR Linewidth in MnF_2 near the Critical Point, *J. Appl. Phys.* 42, 1290-1292 (1971).
10. R.P. Gupta, M.S. Seehra, and W.E. Vehse: Shift of Néel Temperature and EPR Linewidth of KMnF_3 with Mg Doping, *Phys. Rev.* B5, 92-95 (1972).
11. E.E. Bragg and M.S. Seehra: Magnetic Susceptibility of RbMnF_3 , *Phys. Lett.* A39, 29-30 (1972).
12. M.S. Seehra: Role of Anisotropy in the Critical Point Anomaly in EPR Linewidth of MnF_2 , *Phys. Rev.* B6, 2186-2189 (1972).
13. E.E. Bragg and M.S. Seehra: Magnetic Susceptibility of MnF_2 near T_N and Fisher's Relation, *Phys. Rev.* B7, 4197-4204 (1973).
14. D.L. Huber and M.S. Seehra: Critical Point Anomaly in the EPR Linewidth of Two Dimensional Antiferromagnets, *Phys. Lett.* A43, 311-312 (1973).
15. M.S. Seehra and R.P. Gupta: Temperature Dependence of the EPR Linewidth of CrBr_3 near T_c , *Phys. Rev.* B9, 197-202 (1974).
16. D.L. Huber, M.S. Seehra and P.W. Verbeek: Critical Point Anomalies in the Zero-Field Relaxation Rates in MnF_2 , *Phys. Rev.* B9, 4988-4990 (1974).
17. J. Matolyak, M.S. Seehra and A.S. Pavlovic: Magnetostriction in MnF_2 , *Phys. Lett.* A49, 333-334 (1974).
18. M.S. Seehra, V.L. Capanand, P. Silinsky: Electrical Resistivity Study of Curie Temperatures of Fe-Rich Fe-Co Alloys, *Phys. Status Solidi (a)* 26, K141-L143 (1974).

19. M.S. Seehra and D.L. Huber: Paramagnetic Resonance Linebroadening and Spin-Spin Relaxation Near Magnetic Critical Points, AIP Conference Proceedings 24, 261-267 (1975). (Proc. 20th Annual Magnetism Conference)
20. D.L. Huber and M.S. Seehra: Contribution of the Spin Phonon Interaction to the Paramagnetic Resonance Linewidth of CrBr₃, J. Phys. Chem. Solids 36, 723-725 (1975).
21. M.S. Seehra and D.W. Sturm: Paramagnetic Resonance Linewidth of EuO near the Curie Temperature, J. Phys. Chem. Solids 36, 1161-1163 (1975).
22. E.E. Bragg and M.S. Seehra: Analysis of Induced EMF in Vibrating-Sample Magnetometers, J. Phys. E.: Sci. Instr. 9, 216-233 (1979).
23. D.L. Huber and M.S. Seehra: Electron Paramagnetic Resonance in Anisotropic Magnets, Phys. Stat. Sol. (b) 74, 145-149 (1976).
24. M.S. Seehra and P. Silinsky: Order-Disorder and α - γ Transitions in FeCo, Phys. Rev. B13, 5183-5187 (1976).
25. M.S. Seehra and W.S. Sheers: Critical EPR Spin Dynamics in EuO-Sample Shape and Temperature Dependence, Physica 85B, 142-145 (1977).
26. P.A. Montano and M.S. Seehra: A Mossbauer Study of Order-Disorder and α - γ Transitions in FeCo, Phys. Rev. B15, 2437-2441 (1977).
27. P.A. Montano and M.S. Seehra: Magnetism of Iron Pyrite (FeS₂) - A Mossbauer Study in an External Magnetic Field, Solid State Comm. 20, 897-898 (1976).
28. P. Burgardt and M.S. Seehra: Magnetic Susceptibility of Iron Pyrite (FeS₂) between 4.2 and 620 K., Solid State Comm. 22, 153-156 (1977).
29. P. Burgardt and M.S. Seehra: Electron Paramagnetic Resonance in Gadolinium near T_c, Phys. Rev. B16, 1802-1807 (1977).
30. D.E. Husk and M.S. Seehra: Dielectric Constant of Iron Pyrite (FeS₂), Solid State Comm. 27, 1147-1148 (1978).
31. W.W. Kou and M.S. Seehra: Optical Absorption in Iron Pyrite (FeS₂), Phys. Rev. B18, 7062-7068 (1978).
32. M.S. Seehra and S.S. Seehra: Temperature Dependence of the Band Gap of FeS₂, Phys. Rev. B19, 6620-6621 (1979).
33. M.S. Seehra and P. Silinsky: Non-stoichiometry and Temperature-dependent Magnetic Susceptibility of CoO, Solid State Comm. 31, 183-185 (1979).
34. S.S. Seehra, P.A. Montano, M.S. Seehra and S.K. Sen: Preparation and Characterization of Thin Films of FeS₂, J. Material Sci. 14, 2761-2763 (1979).
35. M.S. Seehra and M.S. Jagadeesh: Temperature-dependent Magnetic Susceptibility of Marcasite (FeS₂), Phys. Rev. B20, 2897-2899 (1979).

36. M.S. Jagadeesh and M.S. Seehra: Study of Some Magnetic Properties of a Mixed Phase (Mn_3O_4) in MnO Crystals, Phys. Rev. B21, 2897-2904 (1980).
37. M.S. Jagadeesh and M.S. Seehra: Magnetic Properties of n-type CuInS_2 , Solid State Comm. 34, 257-260 (1980).
38. M.S. Jagadeesh and M.S. Seehra: Electrical Resistivity and Band Gap of Marcasite (FeS_2), Phys. Lett. 80A, 59-61 (1980).
39. N.S. Dalal, J.M. Millar, M.S. Jagadeesh and M.S. Seehra: Paramagnetic Resonance, Magnetic Susceptibility and Antiferromagnetic Exchange in a Cr^{5+} Paramagnet: Potassium Perchromate (K_3CrO_8), J. Chem. Phys. 74, 1916-1923 (1981).
40. S.C. Kondal and M.S. Seehra: Magnetostatic Mode Excitations in EuS, Phys. Rev. B22, 5482-5488 (1980).
41. M.S. Jagadeesh, P. Silinsky and M.S. Seehra: Studies and Removal of Non-stoichiometry in MnO and CoO, J. Appl. Phys. 52, 2315-1216 (1981).
42. M.S. Jagadeesh and M.S. Seehra: An Interpretation of the Anomaly Near 43 K in the Elastic Constants of MnO, Solid State Comm. 37, 369 (1981).
43. M.S. Jagadeesh, H.M. Nagarathna, P.A. Montano and M.S. Seehra: Magnetic and Mossbauer Studies of Phase Transition and Mixed Valences in $\text{Cu}_{4.5}\text{Fe}_{1.2}\text{S}_{4.7}$, Phys. Rev. B23, 2350-2356 (1981).
44. M.S. Jagadeesh and M.S. Seehra: A Comparative Study of the Temperature-dependent Magnetic Susceptibilities of CuInX_2 ($\text{X} = \text{S, Se, Te}$), J. Phys. C 15, 1713-1719 (1982).
45. M.S. Jagadeesh and M.S. Seehra: Principal Magnetic Susceptibilities of MnO and Their Temperature Dependence, Phys. Rev. B23, 1185-1189 (1981).
46. N.S. Dalal, M.M. Suryan, and M.S. Seehra: Potassium Perchromate: Standard for Determination of Paramagnetic Spin Concentration, g Values, and Magnetic Moments of Fossil Fuels, Anal. Chem. 53, 938-940 (1981).
47. P.S. Silinsky and M.S. Seehra: Principal Magnetic Susceptibilities and Uniaxial Stress Experiments in CoO: Phys. Rev. B24, 419-423 (1981).
48. M.S. Jagadeesh and M.S. Seehra: Thermomagnetic Studies of Conversion of Pyrite and Marcasite in Different Atmospheres (Vacuum, H_2 , He, and Co), J. Phys. D: Appl. Phys. 14, 2153-67 (1981).
49. M.S. Seehra and R.E. Helmick: Dielectric Anomaly in MnO near the Magnetic Phase Transition, Phys. Rev. B24, 5098-5102 (1981).
50. S.C. Kondal and M.S. Seehra: Shape Dependence of the EPR Linewidth, Resonance Field, and Spin-Spin Relaxation Rate of EuS near T_c , J. Phys. C. Solid State 15, 2471-2482 (1982).
51. M.S. Seehra and G. Srinivasan: Electron Spin Resonance from Impurities in Coal-Derived

- Pyrites, Fuel 61, 396-398 (1982).
52. G. Srinivasan and M.S. Seehra: Temperature Dependence of the ESR Spectra of Mn^{2+} in FeS_2 , Solid State Comm. 42, 857-859 (1982).
 53. M.S. Seehra and G. Srinivasan: Electron Spin Resonance of Mn_3O_4 Defects in MnO , J. Appl. Phys. 53, 8345-8347 (1982).
 54. G. Chaddha and M.S. Seehra: Magnetization Process and Principal Magnetic Susceptibilities in $RbMnF_3$, Solid State Comm. 44, 1097-1100 (1982).
 55. G. Srinivasan and M.S. Seehra: Changes in Free Radicals in Coal-Derived Pyrrites Upon Heating in N_2 , H_2 , and Vacuum: Role of Pyrite-Pyrrhotite Conversion, Fuel 61, 1249-1253 (1982).
 56. G. Srinivasan and M.S. Seehra: Effect of Pyrite and Pyrrhotite on Free Radical Formation in Coal, Fuel 62, 792-794 (1983).
 57. M.S. Seehra and R.D. Groves: Blue Shifts of the Optical Transitions in MnO below T_N , J. Phys. C: Solid State Phys. 16, L411-L416 (1983).
 58. G. Srinivasan and M.S. Seehra: Magnetic Properties of Mn_3O_4 and a Solution of the Canted Spin Problem, Phys. Rev. B28, 1-7 (1983).
 59. G. Chaddha and M.S. Seehra: Magnetic Components and Particle Size Distribution of Coal Flyash, J. Phys. D: Appl. Phys. 16, 1767-1776 (1983).
 60. G. Srinivasan and M.S. Seehra: Nature of Magnetic Phase Transitions in MnO , Fe_2O , CoO and NiO , Phys. Rev. B28, 6542-6544 (1983).
 61. M.S. Seehra and G. Srinivasan: Magnetic Studies in Non-Stoichiometric Fe_2O and Evidence for Magnetic Defect Clusters, J. Phys. C: Solid State Phys. 17, 883-892 (1984).
 62. M.S. Seehra and R.E. Helmick: Anomalous Changes in the Dielectric Constants of MnF_2 near its Néel Temperature, J. Appl. Phys. 55, 2330-2332 (1984).
 63. M.S. Seehra: Non-Stoichiometry and Magnetic Properties of MnO , Fe_2O , CoO and NiO , a review published in "Basic Properties of Binary Oxides," edited by A. Dominguez Rodriguez, J. Castaing and R. Marquez (Univ. of Sevilla Press, Spain, 1984), pages 179-193.
 64. G. Srinivasan and M.S. Seehra: Variation of Magnetic Properties of Fe_2O with Non-Stoichiometry, J. Appl. Phys. 55, 2327-2329 (1984).
 65. G. Srinivasan and M.S. Seehra: Magnetic susceptibilities, their temperature variation, and exchange constants of NiO , Phys. Rev. B29, 6295-6298 (1984).
 66. J. F. Scott, M. S. Seehra and D. R. Tilley: Unsolved problems in Magnetoelectric $BaMnF_4$, Ferroelectrics 54, 111-114 (1984).
 67. M. S. Seehra and S. Abumansoor: Effect of antiferromagnetic ordering on the optical transitions in MnF_2 , Solid State Commun. 56, 97-99 (1985).
 68. M. S. Seehra, R. E. Helmick, and G. Srinivasan: Effect of temperature and antiferromagnetic

- ordering on the dielectric constants of MnO and MnF₂, J. Phys. C. 19, 1627-1635 (1986).
69. M. S. Seehra: Comment on the Raman Study of the Thermal Transformation of Calcium Hydroxide, J. Solid State Chem. 63, 344-345 (1986).
 70. M. S. Seehra, B. Ghosh and S. E. Mullins: Evidence for different temperature stages in coal pyrolysis from in-situ ESR spectroscopy, Fuel 65, 1315-1316 (1986).
 71. S. Darwish, S. Abumansoor and M. S. Seehra: Thermal behavior of the two-exciton bands in MnF₂ and RbMnF₃, Phys. Rev. B. 34, 3198-3202 (1986).
 72. R. Kannan, A. S. Pavlovic and M. S. Seehra: Variation of Néel temperatures with magnetic dilution in Co_pMg_{1-p}O: J. Phys. C. (Letters) 19, L747-L751 (1986).
 73. B. Ghosh and M. S. Seehra: High temperature in-situ ESR spectroscopy of coals: Distinct temperature stages in coal pyrolysis and effects of Lewis acids, Proc. Third Pittsburgh coal conference, pp 704-716 (1986).
 74. R. Kannan and M.S. Seehra: Percolation Effects and Magnetic Properties of Randomly-Diluted Co_pMg_{1-p}O, Phys. Rev. B. 35, 6847-6853 (1987).
 75. S. Darwish and M.S. Seehra: Vibronically-induced two exciton bands in KMnF₃ and RbMnF₃, Phys. Rev. B 37, 3422-3427 (1988).
 76. M.S. Seehra: Use of magnetic studies, electron spin resonance, FTIR and photoacoustic spectroscopy in coal research, Proc. Fourth Annual Pittsburgh Coal Conf., pp 560-563 (1987).
 77. M.S. Seehra and B. Ghosh: Free radicals, kinetics, and phase changes in the pyrolysis of eight American coals, J. Anal. Appl. Pyrolysis 13, 209-220 (1988).
 78. M.S. Seehra, B. Ghosh, J.W. Zondlo and E. Mintz: Relationship of coal extraction with free radicals and coal macerals, Fuel Processing Technology 18, 279-286 (1988).
 79. M.S. Seehra, J.C. Dean, and R. Kannan: Magnetic Phase Diagrams of Diluted fcc Antiferromagnets Co_pMg_{1-p}O and Eu_pSr_{1-p}Te, Phys. Rev. B 37, 5864-5865 (1988).
 80. M.S. Seehra, Z. Feng and R. Gopalakrishnan: Magnetic phase transitions in cupric oxide, J. Phys. C: Solid State Phys. 21, L1051-L1054 (1988).
 81. M.S. Seehra and T.M. Giebultowicz: Magnetic Structures of FCC Systems with Nearest-Neighbor and Next-Nearest-Neighbor Exchange Interactions, Phys. Rev. B 38, 11898 (1988).
 82. T.M. Giebultowicz, J.J. Rhyne, M.S. Seehra and R. Kannan: Neutron Diffraction in Co_pMg_{1-p}O Solid Solution, J. de. Physique C8, 1105-1106 (1988).
 83. B.L. Gordon and M. S. Seehra: Magnetic susceptibility of Mn²⁺ ions in MgO and evidence of exchange clustering, Phys. Rev. B 40, 2348-2353 (1989).
 84. M.S. Seehra and R.S. Pandurangi: Anomalous enhancement of the surface IR modes in photoacoustic spectroscopy of SiO₂ particles, J. Phys. Condensed Matter 1, 5301-5304 (1989).

85. J. Zhao and M.S. Seehra: Dependence of T_c of $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+x}$ on high temperature cycling and oxygen stoichiometry: *Physica C* 159, 639-642 (1989).
86. R.S. Pandurangi, M.S. Seehra, B.L. Razzaboni and P. Bolsaitis: Surface and bulk infra red modes of crystalline and amorphous silica particles: A study of the relation of surface structure to cytotoxicity of respirable silica: *Environmental Health Perspectives* 86, 327-336 (1990).
87. R. Gopalakrishnan and M.S. Seehra: Kinetics of the High Temperature Reaction of SO_2 with CaO Particles using gas-phase FTIR Spectroscopy: *Energy and Fuels* 4, 226-230 (1990).
88. F.W. Oliver, E.C. Hammond, L. Bang-Zheng, L. Meng-Zhao & M.S. Seehra: Mossbauer and magnetic susceptibility studies on $\text{MmNi}_{4.15}\text{Fe}_{0.85}$ and its hydride, *J. Appl. Phys.* 67, 5873-5875 (1990).
89. M.M. Ibrahim, M.S. Seehra and R.A. Keogh: Comparison of the Liquefaction yields of coals with their composition, free radical density and thermal parameters, *Fuel Processing Technology* 25, 215-226 (1990).
90. J. Zhao, M. Wu, W. Abdul-Razzaq and M. S. Seehra: Interrelationship between the transition temperatures of the (2223) and (2212) phases of Bi-based superconductors: *Physica C* 165, 135-138 (1990).
91. J. Zhao, V. Suresh Babu, M.S. Seehra, A.F. Hepp, J.R. Gaier and R.M. Richman: Effects of oxygen stoichiometry on the magnetic ordering of $\text{La}_2\text{Ni}_{1-y}\text{Cu}_y\text{O}_{4+x}$, *Proc. Materials Research Society* 169, pp 57-60 (1990).
92. M.J. Keane, W.E. Wallace, M.S. Seehra, C. Hill, V. Vallyathan, P.S. Raghoottama and P. Mike: Respirable particulate interaction with the lecithin component of pulmonary surfactant, *Proc. VII Intern. Pneumoconioses Conf. Part I*, pp. 231-244 (1990).
93. R.S. Pandurangi and M.S. Seehra: Effect of particle size and modulation frequency on the photoacoustic spectra of silica powders: *Anal. Chem.* 62, 1943-1947 (1990).
94. J. Coletti, V. Suresh Babu, A.S. Pavlovic and M.S. Seehra: Localized moment in Mn-doped $\square$ -TiAl alloys: *Phys. Rev. B* 42, 10754-10757 (1990).
95. M.M. Ibrahim, M.S. Seehra: Depolymerization of coals promoted by zinc halides near 100°C : *Energy and Fuels* 5, 74-78 (1991).
96. V. Suresh Babu and M.S. Seehra: Site selectivity of Mn atoms in $\square$ -TiAl alloys determined by x-ray scattering, *J. Mater. Res.* 6, 339-342 (1991).
97. B.U. Maheshwar Rao, G. Srinivasan, V. Suresh Babu and M.S. Seehra: Magnetic properties of amorphous BiFeO_3 - PbZrO_3 sputtered films: *J. Appl. Phys.* 69, 5463-5465 (1991).
98. R.S. Pandurangi and M.S. Seehra: Interaction of silanol species on silica surface with hydrogen bonding agents studies by photoacoustic spectroscopy, *Applied Spectroscopy* 45, 673-676 (1991).
99. J. Zhao and M.S. Seehra: Dependence of transition temperature on hole concentration per CuO_2 sheet in the Bi-based superconductors: *NASA Conf. Publication 3100*, 55-59 (1991).
100. J. Zhao, V. Suresh Babu and M. S. Seehra: Observation of Metastable field-cooled magnetization

- in Y-doped Bi(2212) Superconductors, *Physica C* **178** 432-436 (1991).
101. G. Srinivasan, B.U.M. Rao, J. Zhao, and M.S. Seehra: Magnetically ordered amorphous copper ferrite, *Appl. Phys. Letters* **59**, 372-374 (1991).
 102. Z. Feng, V. Suresh Babu, J. Zhao, and M.S. Seehra: Effect of magnetic dilution on the magnetic ordering in $\text{Ni}_p\text{Mg}_{1-p}\text{O}$, *J. Appl. Phys.* **70**, 6161-6163 (1991).
 103. V. Suresh Babu, R.S. Pandurangi and M.S. Seehra: X-ray diffraction and IR spectroscopy of three forms of silica and mine dust: *Proc. Third Symposium on Respirable Dust*, 253-258 (1991).
 104. R. S. Pandurangi and M.S. Seehra: Hemolytic ability of different forms of silica and role of the surface silanol species: *Proc. Third Symposium on Respirable Dust*, 121-125 (1991).
 105. Z. Feng and M.S. Seehra: Phase diagram and magnetic properties of diluted fcc system $\text{Ni}_p\text{Mg}_{1-p}\text{O}$, *Phys. Rev. B* **45**, 2184-2189 (1992).
 106. M. Wu, V. Suresh Babu, M.S. Seehra, and W. Abdul-Razzaq: Two magnetic ordering temperatures in Fe/Al multilayered films, *Phys. Rev. B* **45**, 2285-2289 (1992).
 107. M.M. Ibrahim, J. Zhao and M.S. Seehra, Determination of the particle size distribution in Fe_2O_3 -based catalyst using magnetometry and x-ray diffraction, *J. Mater. Res.* **7**, 1856-1860 (1992)
 108. M.M. Ibrahim, Z. Feng, J.C. Dean, and M.S. Seehra, Magnetic susceptibilities of Co and Ni doped MgO, *J. Phys. Condens. Matter* **4**, 7127-7134 (1992).
 109. M.M. Ibrahim and M.S. Seehra, An Apparatus for in-situ high temperature/high pressure ESR spectroscopy and its applications in coal conversion studies, *ACS Division Fuel Chem. Preprints*, **37**, 1131-1140 (1992).
 110. V. Suresh Babu and M.S. Seehra, Temperature dependence of the infrared spectra of C_{60} : orientational transition and freezing, *Chem. Phys. Letters* **196**, 569-572 (1992).
 111. R.S. Pandurangi and M.S. Seehra: Quantitative analysis of silica in silica-kaolin mixtures by photoacoustic and diffuse reflectance spectroscopies, *Applied Spectroscopy* **46**, 1719-1723 (1992).
 112. M.S. Seehra and H.P.J. Wijn: Book Chapter entitled "Magnetic Properties of Binary Oxides of d Transition Elements", in "Magnetic Properties of Non-Metallic Inorganic Compounds Based on Transition Elements" edited by H.P.J. Wijn, Vol. 27g in the Landolt-Börnstein series (Springer-Verlag, 1992) page 1-86.
 113. T.G. Castner and M.S. Seehra: Critical behavior of the electron-paramagnetic-resonance linewidth of a spin-1/2 two-dimensional antiferromagnet, *Phys. Rev. B. (Rapid Commun.)* **B47**, 578-581 (1993-I).
 114. M.S. Seehra, R. Kannan and M.M. Ibrahim, Magnetic specific heat and critical magnetic susceptibility of the diluted antiferromagnetic $\text{Co}_p\text{Mg}_{1-p}\text{O}$, *J. Appl. Phys.* **73**, 5468-5470 (1993).
 115. G.P. Huffman, B. Ganguly, J. Zhao, K.R.P.M. Rao, N. Shah, Z. Feng, F.E. Huggins, M.M. Taghiei, F. Lu, I. Wender, V.R. Pradhan, J.W. Tierney, M.S. Seehra, M.M. Ibrahim, J. Shabtai

- and E.M. Eyring, Structure and dispersion of Fe-based catalysts for direct coal liquefaction, *Energy & Fuels* 7, 285-296 (1993).
116. V. Suresh Babu, A.S. Pavlovic and M.S. Seehra: Site selectivities and magnetic moments of V, Cr and Mn doped in gamma-TiAl alloys, *J. Mater. Res.* 8, 989-994 (1993).
 117. V. Suresh Babu and M.S. Seehra: Quantification of silica in mine dusts using diffuse reflectance infrared spectroscopy, *Appl. Spectroscopy* 47, 830-833 (1993).
 118. M.S. Seehra and A.S. Pavlovic: X-ray diffraction, thermal expansion, electrical conductivity, and optical microscopy studies of coal-based graphites, *Carbon* 31, 557-564 (1993).
 119. M.M. Ibrahim and M.S. Seehra: Free radical investigations of direct coal liquefaction with Fe-based catalysts using electron spin resonance spectroscopy, *ACS Div. Fuel Chem. Preprints* 38, 180-184 (1993).
 120. V. Suresh Babu, P.K. Khowash, M.S. Seehra, B.R. Cooper, and D.L. Price: Magnetic moment determination of site selection of additives in α -TiAl alloys in High Temperature Ordered Intermetallic Alloys V, edited by I. Baker, J. D. Wittenburger, R. Darolia and M. H. Yoo (*Mater. Res. Soc. Symp. Proc.* 288, 343-348 (1993)).
 121. V. Suresh Babu and M.S. Seehra: Rietveld profile refinement of the x-ray diffraction patterns of graphites, *Proc. 21st. Biennial Conf. Carbon (Buffalo, N.Y.)* pp. 665-666 (1993).
 122. A.S. Pavlovic and M.S. Seehra: Comparison of the properties of coal-based graphites and commercial graphites, *Proc. 21st. Biennial Conf. Carbon (Buffalo, N.Y.)* pp. 663-664 (1993).
 123. M.M. Ibrahim and M.S. Seehra: Thermogravimetric and free radical evidence for improved liquefaction of coal with waste tires, *ACS Fuel Chem. Preprints* 38, 841-847 (1993).
 124. M.M. Ibrahim and M.S. Seehra: Thermal conversion of coal liquefaction resid: Temperature-programmed electron spin resonance and thermogravimetric investigations, *Catalysis Today* 19, 337-352 (1994).
 125. M.M. Ibrahim and M.S. Seehra: Testing Fe-based catalysts for direct coal liquefaction using in-situ electron spin resonance spectroscopy, *Energy & Fuels* 8, 48-52 (1994).
 126. M.M. Ibrahim, G. Edwards, M.S. Seehra, B. Ganguly and G.P. Huffman: Magnetism and Spin Dynamics of Nanoscale FeOOH particles, *J. Appl. Phys.* 75, 5873-5875 (1994).
 127. M.M. Ibrahim, M.S. Seehra and G. Srinivasan: Observations of magnetization reversal and magnetic clusters in amorphous copper ferrite films, *J. Appl. Phys.* 75, 6822-6824 (1994).
 128. M.S. Seehra, A.S. Pavlovic, V. Suresh Babu, J.W. Zondlo, P.G. Stansberry and A.H. Stiller: Measurements and control of anisotropy in ten coal-based graphites, *Carbon* 32, 431-435 (1994).
 129. M.S. Seehra and G. Srinivasan: Book chapter entitled "Magnetic properties of amorphous oxides", published in the book "Magnetic Properties of Non-Metals, Vol. III-27/f3 in the Landolt-Bornstein series (Springer-Verlag Publishers), pages 239-319, 1994.
 130. M.M. Ibrahim, S. Darwish and M.S. Seehra: Non-linear temperature variation of magnetic

- viscosity in nanoscale FeOOH particles, Phys. Rev. B 51, 2955-2959 (1995-I).
131. V. Suresh Babu, L. Farinash and M.S. Seehra: Carbon in diesel particulate matter: structure, microwave absorption and oxidation, J. Mater. Res. 10(5), 1075-1078 (1995).
 132. J. Chen, G. Srinivasan, S. Hunter, V. Suresh Babu and M.S. Seehra: Observation of superparamagnetism in RF sputtered films of zinc ferrite, J. Magnetism & Magnetic Materials 146, 291-297 (1995).
 133. V. Suresh Babu, M.S. Seehra, J. Chen, G. Srinivasan and R. Hasse: The magnetic behavior of Fe₂O₃-Bi₂O₃-ZnO films, Physica B 212, 139-143 (1995).
 134. G. Srinivasan, V. Suresh Babu and M.S. Seehra: Magnetic properties of radio frequency sputtered thin films of La-Pb-Mn Oxides, Appl. Phys. Letters 67, 2090-2092 (1995).
 135. M.M. Ibrahim and M.S. Seehra: Free radical monitoring of the coprocessing of coal with chemical components of waste tires, Fuel Processing Technology 45, 213-219 (1995).
 136. M.M. Ibrahim and M.S. Seehra: Book Chapter entitled "Coprocessing of coal with waste tires and polymers: in-situ electron spin resonance investigations", in Conversion and Utilization of Waste Materials (M. Rashid Khan, editor) Taylor and Francis, pp. 123-133, 1996.
 137. M.S. Seehra and M.M. Ibrahim: Book Chapter entitled "Applications of electron spin resonance spectroscopy to catalysis in direct coal liquefaction", Catalysis Vol. 12 (The Royal Society of Chemistry, UK 1996) pp. 302-320.
 138. A.S. Pavlovic, V. Suresh Babu and M.S. Seehra: High temperature thermal expansion of binary alloys of Ni with Cr, Mo and Re: comparison with molecular dynamics simulations, J. Phys.: Condens. Matter 8, 3139-3149 (1996).
 139. V. Suresh Babu and M.S. Seehra: Development and evaluation of diffuse reflectance spectroscopy for determining silica in respirable dusts, Appl. Occup. Environ. Hyg. 11, 767-770 (1996).
 140. V. Suresh Babu, S. Popuri, M. Gautam and M.S. Seehra: Thermal and microwave characteristics of diesel particulate in relation to microwave regeneration of traps, Appl. Occup. Environ. Hyg. 11, 799-803 (1996).
 141. G. Srinivasan, V. Suresh Babu and M. S. Seehra: Magnetic and Magneto-resistance studies on radio-frequency sputtered La-Pb-MnO films, J. Appl. Phys. 79, 5185-5187 (1996).
 142. M.S. Seehra and V. Suresh Babu: Low-temperature magnetic transition and high-temperature oxidation in INCONEL 718 superalloy, J. Mater. Res. 11, 1133-1136 (1996).
 143. V. Suresh Babu, A.S. Pavlovic and M.S. Seehra: Rapid loss of magnetic order in Ni on alloying with Cr, Mo, Re and Si, J. Appl. Phys. 79, 5230-5232 (1996).
 144. V. Suresh Babu and M.S. Seehra: Modeling of disorder and x-ray diffraction in coal-based graphitic carbons, Carbon 34, 1259-1265 (1996).
 145. M. S. Seehra, M. M. Ibrahim, V. S. Babu and G. Srinivasan: The linear temperature dependence of

- the paramagnetic resonance linewidth in the manganate perovskites $\text{La}_{0.67}\text{Sr}_{0.33}\text{MnO}_3$ and $\text{La}_{0.62}\text{Bi}_{0.05}\text{Ca}_{0.33}\text{MnO}_3$, *J. Phys.: Condens. Matter* **8**, 11283-11289 (1996).
146. M.M. Ibrahim, E. Hopkins and M.S. Seehra: Thermal and catalytic degradation of commingled plastics, *Fuel Processing Technology* **49**, 65-73 (1996).
 147. M.M. Ibrahim and M.S. Seehra: Effects of hydrogen pressure and temperature on the free radicals in coal and coal/tire mixtures, *Fuel Processing Technology* **49**, 197-205 (1996).
 148. S. Smith, K.Z. Baba-Kishi, C.A. Randall, T.T. Srinivasan, V. Suresh Babu, M.S. Seehra and P. Osbond: Magnetic Properties of $\text{Y}_2\text{Cu}_2\text{O}_8$ and $\text{Y}_{1.9}\text{Ca}_{0.1}\text{Cu}_2\text{O}_8$, *J. Mater. Sci. Letters* **15**, 67-68 (1996).
 149. G. Srinivasan, R. M. Savage, V. Suresh Babu and M. S. Seehra: Anomalies in the structural and magnetotransport properties of thin films of Bi-substituted La-Ca-Mn-O, *J. Magn. Magn. Materials* **168**, 1-8 (1997).
 150. D. Seifu, F. W. Oliver, E. Hoffman, A. Aning, V. Suresh Babu, M.S. Seehra and R.M. Catchings: Study of mechanically alloying of Sm and Fe, *J. Appl. Phys.* **81**, 5805-5807 (1997).
 151. V. Suresh Babu, M.S. Seehra, G. Srinivasan and R.M. Savage: Magneto-transport properties of Bi-substituted thin films of La-Ca-Mn-O, *Applied Physics Letters* **70**, 667-669 (1997).
 152. M.M. Ibrahim and M.S. Seehra: Sulfur promoted degradation of polyethylene/polypropylene detected by electron spin resonance spectroscopy, *Energy & Fuels* **11**, 926-930 (1997).
 153. V. Suresh Babu, A.S. Pavlovic and M.S. Seehra: Oxidation characteristics and thermal expansion of Inconel alloy 718 from 300 K to 1273 K, "Superalloys 718, 625, 706 and various derivatives", E. A. Loria, Editor (TMS Publications, Warrendale, PA 15086) pp. 689-693 (1997).
 154. A. Manivannan and M.S. Seehra: Identification and quantification of polymers in waste plastics using differential scanning calorimetry, *ACS Fuel Division Preprints* **42**, 1028-1032 (1997).
 155. V. Suresh Babu and M.S. Seehra: Effects of Re concentration on the expansivity of NiRe alloys to 1200 K, *J. Phys.: Condens. Matter* **10**, 7349-7356 (1998).
 156. D. Seifu, F.W. Oliver, E. Hoffman, A. Aning, V. Suresh Babu and M.S. Seehra: Magnetic properties of nanoscale $\text{SM}_{0.25}\text{Zr}_{0.75}\text{Fe}_3$ produced by mechanical alloying, *J. Magn. Magn. Mater.* **189**, 305-309 (1998).
 157. A. Manivannan, M. Chirila, N.C. Giles and M.S. Seehra: Microstructure, dangling bonds and impurities in activated carbons, *Carbon* **37**, 1741-1747 (1999).
 158. M.S. Seehra, V.S. Babu, A. Manivannan and J.W. Lynn, Neutron scattering and magnetic studies of ferrihydrite nanoparticles, *Phys. Rev. B* **61**, 3513-3518 (2000).
 159. D. Seifu, A. Kebede, F.W. Oliver, E. Hoffman, E. Hammond, C. Wynter, A. Aning, L. Takacs, I.L. Siu, J.C. Walker and M.S. Seehra: Evidence of ferrimagnetic ordering in FeMnO_3 produced by mechanical alloying, *J. Magn. Magn. Materials* **212**, 178-182 (2000).
 160. A. Manivannan and M.S. Seehra: X-ray diffraction analysis of the particulate matter in residual

oil flyash, American Chemical Society Fuel Division Preprints, 45, 1-5 (2000).

161. M.S. Seehra, A. Manivannan, C. Cionca, L. Ma and K.-M. Chang: Effects of heat treatments and thermomechanical processing on the beta and gamma phases in Inconel 783 alloy, Advanced Technologies for Superalloy Affordability edited by K.-M. Chang, S. K. Srivastava, D. V. Furrer and K. R. Bain (TMS Publications (2000), Warrendale, PA 15086) pp. 141-148.
162. W. Abdul-Razzaq, A. Manivannan and M.S. Seehra: Nature of magnetism in Cr nanoparticles produced by ball-milling, Cluster and Nanostructure Interfaces edited by P. Jena, S.N. Khanna & B.K. Rao (World Scientific Publishing Co., 2000) pp. 185-190.
163. M.S. Seehra, V.S. Babu, Paromita Roy and A. Manivannan: Influence of chemisorption on the magnetism of interacting ferrihydrite nanoparticles, Cluster and Nanostructure Interfaces edited by P. Jena, S.N. Khanna & B.K. Rao (World Scientific Publishing Co., 2000) pp. 229-234.
164. A. Manivannan, A. Punnoose and M.S. Seehra: Interaction of oxygen with nanophase carbons investigated by electron spin resonance spectroscopy, Mater. Res. Soc. Symp. Proc. Vol. 593, pp. 365-370 (2000).
165. M.S. Seehra, Paromita Roy and A. Manivannan: Hysteresis loop shifts in magnetic field cooled FeOOH nanoparticles. Mater. Res. Soc. Symp. Proc. Vol. 581 (2000) pp. 511-516
166. M.S. Seehra, C. Cionca and A. Manivannan: Thermal expansions of the beta and gamma phases in a Co-Ni-Fe superalloy determined by x-ray diffraction, J. Mater. Res. 15, 1719-723(2000)
167. G. P. Huffman, F. E. Huggins, N. Shah, R. Huggins, W. P. Linak, C. A. Miller, R. J. Rugmire, H. L. C. Meuzelaar, M. S. Seehra and A. Manivannan: Characterization of fine particulate matter produced by combustion of residual fuel oil, J. Air & Waste Manage. Assoc., 50, 1106-1114 (2000).
168. A. Manivannan and M. S. Seehra, Identification of inorganics in the NIST SRM 1648 sample of urban particulate matter, American Chemical Society Division of Fuel Chemistry Preprints, 45, 446-450 (2000).
169. G.P. Huffman, F.E. Huggins, N. Shah, S. Pattanaik, H.L.C. Meuzelaar, S.J. Jeon, D. Smith, B. Harris, M.S. Seehra and A. Manivannan: Structure of primary PM_{2.5} derived from diesel truck exhaust, American Chemical Society, Division of Fuel Chemistry Preprints, 45, 441-445 (2000).
170. M.S. Seehra and A. Punnoose: Deviations from the Curie-law variation of magnetic susceptibility in antiferromagnetic nanoparticles, Phys. Rev. B 64, 132410 (4 pages) (2001).
171. A. Punnoose, H. Magnone, M.S. Seehra, and J. Bonevich: Bulk to nanoscale magnetism and exchange bias in CuO nanoparticles, Phys. Rev. B 64, 174420 (8 pages) (2001).
172. G. Srinivasan, T.P. Mullin, D. Hanna, A. Manivannan and M.S. Seehra: Magnetic and high pressure magnetotransport properties of Cs substituted lanthanum calcium manganites, Appl. Phys. A 72, 333-339 (2001).
173. M.S. Seehra, A. Punnoose, P. Roy and A. Manivannan: Effect of Si doping on the electron spin resonance properties of ferrihydrite nanoparticles, IEEE Transactions on Magnetics 37, 2207-2209 (2001).

174. A. Punnoose, H. Magnone and M. S. Seehra: Synthesis and antiferromagnetism of Mn_5O_8 , IEEE Transaction on magnetics 37, 2150-2152 (2001).
175. A. Punnoose, M. S. Seehra and I. Wender: Structure, properties and roles of the different constituents in $\text{Pt}/\text{WO}_x/\text{ZrO}_2$ catalysts, Fuel Process. Technol. 74, 33-47 (2001).
176. A. Manivannan, A.M. Constantinescu and M.S. Seehra: Synthesis of CoFe_2O_4 nanoparticles via the ferrihydrite route, Mater. Res. Soc. Symp. Proc. Vol. 658 (2001), pp. GG6.32.1 to GG6.32.6.
177. A. Punnoose, M.S. Seehra, B.C. Dunn and E.M. Eyring: Characterization of $\text{CuCl}_2/\text{PdCl}_2$ /activated carbon catalysts for the synthesis of diethyl carbonate, Energy & Fuel 16, 182-188 (2002).
178. A. Punnoose and M.S. Seehra: ESR observation of W^{5+} and Zr^{3+} states in $\text{Pt}/\text{WO}_x/\text{ZrO}_2$ catalysts, Catalysis Letters 78, 157-160 (2002).
179. A. Manivannan, M.S. Seehra, D.A. Tryk and A. Fujishima: Electrochemical detection of ionic mercury at boron-doped diamond electrodes, Analytical Letters 35, 355-368 (2002).
180. A. Punnoose and M.S. Seehra: Hysteresis anomalies and exchange bias in 6.6 nm CuO nanoparticles, J. Appl. Phys. 91, 7766-7768 (2002).
181. N. Shah, F.E. Huggins, D. Panjala, G.P. Huffman, A. Punnoose & M.S. Seehra: Supported binary catalysts for dehydrogenation of methane, ACS Fuel Chem. Div. Prep. 47 (1) 132-133 (2002).
182. W.K. Park, R.J. Ortega-Hertogs, J.S. Moodera, A. Punnoose and M.S. Seehra: Semiconducting and ferromagnetic behavior of sputtered Co-doped TiO_2 thin films above room temperature, J. Appl. Phys. 91, 8093-8095 (2002).
183. A. Punnoose and M.S. Seehra: Temperature dependence of paramagnetic resonance in pure and doped ferrihydrite nanoparticles; Book Chapter in "EPR in the 21st Century: Basics and Applications to Material, Life and Earth Sciences," edited by A. Kawamori, J. Yamauchi and H. Ohta (Elsevier Sciences 2002) pp. 162-167.
184. W. Abdul-Razzaq and M.S. Seehra: Observation of oxidation and mechanical strain in Cr nanoparticles produced by ball-milling, Phys. Stat Solidi (a) 193, 94-102 (2002).
185. A. Punnoose, M.S. Seehra: Finite size effects in CuO nanoparticles, Proc. Ninth Annual Intern. Conf. Composites Engineering (July 1-6, 2002, San Diego, CA), David Hui, Editor, pp. 639-640.
186. A. Punnoose, E.H. Morales, Y. Wang, D. Lederman and M.S. Seehra: Hysteretic ferromagnetic resonance as a probe for coercivity, exchange-bias and loop asymmetry, J. Appl. Phys. (Letter) 93 771-773 (2003).
187. A. Punnoose, M.S. Seehra, W.K. Park and J.S. Moodera: On the room temperature ferromagnetism in Co-doped TiO_2 films, J. Appl. Phys. 93, 7867-7869 (2003).
188. D.R. Dubois, D.L. Obrzut, J. Liu, J. Thundimadathil, A.M. Prakash, J.A. Guin, A. Punnoose and M.S.

- Seehra: Conversion of Methanol to Olefins over, Cobalt, Manganese and Nickel Incorporated SAPO-34 Molecular Sieves, *Fuel Processing Technology* 83, 203-218 (2003).
189. A. Punnoose, N. Shah, G.P. Huffman and M.S. Seehra: X-ray Diffraction and Electron Magnetic Resonance Studies of M/Fe/Al₂O₃ (M = Ni, Mo, Pd) catalysts for CH₄ to H₂ Conversion, *Fuel Processing Technology* 83, 263-273 (2003).
 190. A. Manivannan, M. S. Seehra, S. B. Majumder and R.S. Katiyar: Magnetism of Co-doped Titania thin films prepared by spray pyrolysis, *Appl. Phys. Letters* 83, 111-113 (2003).
 191. M.S. Seehra and A. Punnoose: Particle size dependence of exchange-bias and coercivity in CuO nanoparticles, *Solid State Commun.* 128, 299-302 (2003).
 192. A. Manivannan, G. Glaspell and M.S. Seehra: Controlled transformation of paramagnetism to room temperature ferromagnetism in cobalt-doped titanium dioxide, *J. Appl. Phys.* 94, 6994-6996, (2003).
 193. A. Manivannan, M.S. Seehra and A. Fujishima: Detection of mercury at the ppb level in solution using boron doped diamond electrode, *Fuel Processing Technology* 85, 513-519 (2004).
 194. A. Punnoose, T. Phanthavady, M.S. Seehra, N. Shah and G.P. Huffman: Magnetic properties of ferrihydrite nanoparticles doped with Ni, Mo and Ir, *Phys. Rev. B* 69, 054425 (9 pages) 2004.
 195. M.S. Seehra, P. Dutta, H. Shim and A. Manivannan: Temperature dependence of electron magnetic resonance and magnetization in NiO nanorods, *Solid St. Commun.* 129, 721-725, (2004).
 196. P. Dutta, A. Manivannan, M.S. Seehra, P.M. Adekkanattu and J. Guin: Determination of electronic state and concentration of Ni in NiSAPO catalysts by magnetic measurements, *Catalysis Letters* 94, 181-185 (2004).
 197. M.S. Seehra, P. Roy, A. Raman and A. Manivannan: Structural investigations of synthetic ferrihydrite nanoparticles doped with Si, *Solid State Commun.* 130, 597-601 (2004).
 198. A. Manivannan, S. Underwood, E.H. Morales and M.S. Seehra: Magnetic and electrical characterization of heavily boron-doped diamond, *Mater. Characterization* 51, 329-333 (2004).
 199. A. Manivannan, G. Glaspell, L. Riggs, S. Underwood and M.S. Seehra: Room temperature synthesis and characterization of pure and Co-doped ZnO, *Proc. Electrochemical Society Low Temperature Symposium* edited by C. L. Claves, W. Wong-Ny and K. M. Nair (The Electrochemical Society, 2004) pp. 129-135.
 200. M.V. Iyer, L.P. Norcio, A. Punnoose, E. L. Kugler, M.S. Seehra and D.B. Dadyburjor: Catalysis for synthesis gas formation from reforming of methane: *Topics in Catalysis* 29, 197-200 (2004).
 201. B.C. Dunn, D.L. Covington, P. Cole, R. J. Pugmire, H.L.C. Meuzelaar, R.D. Ernst, E.C. Heider, E.M. Eyring, N. Shah, G.P. Huffman, M.S. Seehra, A. Manivannan and P. Dutta: Silica xerogel supported cobalt metal Fischer-Tropsch catalysts for syngas to diesel fuel range conversion, *Energy & Fuels* 18, 1519-1521 (2004).
 202. P. Dutta, A. Manivannan, M.S. Seehra, N. Shah and G.P. Huffman: Magnetic properties of nearly defect-free maghemite nanocrystals, *Phys. Rev. B* 70, 174428 (7 pages) (2004).

203. P. Dutta, N.O. Elbashir, A. Manivannan, M.S. Seehra and C.B. Roberts: Characterization of Fischer-Tropsch cobalt-based catalysts (Co/SiO₂, Co/Al₂O₃) by x-ray diffraction and magnetic measurements, *Catal. Letters* 98, 203-210 (2004).
204. A. Punnoose, M.S. Seehra, J. van Tol and L.C. Brunel: High frequency electron magnetic resonance and magnetic studies of ferrihydrite nanoparticles and evidence of a phase transition, *J. Magn. Magn. Mater.* 288, 168-172 (2005).
205. M.S. Seehra, H. Shim, P. Dutta, A. Manivannan and J. Bonevich: Interparticle interaction effects in the magnetic properties of 5 nm NiO nanorods, *J. Appl. Phys.* 97, 10J509 (3 pages) (2005).
206. A. Manivannan, G. Glaspell, P. Dutta and M.S. Seehra: Nature of the reversible paramagnetism to ferromagnetism state in cobalt-doped titanium dioxide, *J. Appl. Phys.* 97, 10D325 (3 pages) (2005).
207. A. Manivannan, L. Ramakrishnan, M.S. Seehra, E. Granite, J.E. Butler, D.A. Tryk and A. Fujishima: Mercury detection at boron doped diamond electrodes using rotating disk technique, *J. Electroanalytical Chemistry* 577, 287-293 (2005).
208. M.S. Seehra and V. Suresh Babu: Low-temperature magnetic transition and high temperature oxidation in Inconel alloy 718, Erratum and Addendum, *J. Materials Research* 20, 1081-1082 (2005).
209. N.O. Elbashir, P. Dutta, A. Manivannan, M.S. Seehra and C.B. Roberts: Impact of cobalt-based catalyst characteristics on the performance of conventional gas-phase and supercritical-phase Fischer-Tropsch synthesis, *Applied Catalysis: General* 285, 169-180 (2005).
210. S. Neeleshwar, C.L. Chen, C.B. Tsai, Y.Y. Chen, C.C. Chen, S.G. Shyu and M.S. Seehra: Size dependent properties of CdSe quantum dots, *Phys. Rev. B (Rapid Commun)*; B71, 201307R/1-4, 2005.
211. M.S. Seehra, P. Dutta and A. Manivannan: Determination of different electronic states of cobalt in Fischer-Tropsch catalyst Prepr. Paper – Am. Chem. Soc., Div. Fuel Chem. 50, 638-639 (2005).
212. N.O. Elbashir, P. Dutta, M.S. Seehra and C.B. Roberts: Stability and structure of cobalt catalytic systems in Fischer-Tropsch synthesis: Supercritical fluid media versus conventional gas-phase media, *Prepr. Pap.-Am. Chem. Soc., Div. Fuel Chem.* 50, 598-600 (2005).
213. P. Dutta, B.C. Dunn, E.M. Eyring, N. Shah, G.P. Huffman, A. Manivannan and M.S. Seehra: Characteristics of cobalt nanoneedles in 10% Co/aerogel Fischer-Tropsch catalyst, *Chem. Materials* 17, 5183-5186 (2005).
214. S.B. Majumder, S. Bhattacharyya, R.S. Katiyar, A. Manivannan, P. Dutta and M.S. Seehra: Dielectric and magnetic properties of sol-gel derived Pb(Fe_{0.5}Nb_{0.5})O₃ ceramics, *J. Appl. Phys.* 99, 024108 (7 pages) 2006.
215. H. Shim, A. Manivannan, M.S. Seehra, K.M. Reddy and A. Punnoose: Effect of interparticle interaction on the magnetic relaxation of NiO nanorods, *J. Appl. Phys.* 99, 08Q503 (3 pages) 2006.
216. P. Dutta, A. Manivannan, M.S. Seehra, N. Shah and G.P. Huffman: Magnetic and structural properties of DNA-maghemite nanocomposite, *J. Appl. Phys.* 99, 08H105 (3 pages) 2006.
217. A. Manivannan, P. Dutta, G. Glaspell and M.S. Seehra: Nature of magnetism in Co and Mn substituted ZnO prepared by sol-gel technique, *J. Appl. Phys.* 99, 08M110 (3 pages) 2006.

218. P. Dutta, S. Pal, M.S. Seehra, Y. Shi, E.M. Eyring and R.D. Ernst: Concentration of Ce^{3+} and oxygen vacancies in cerium oxide nanoparticles, *Chem. Mater.* 18, 5144-5146 (2006).
219. N. Ortega, P. Bhattacharya, R.S. Katiyar, P. Dutta, A. Manivannan, M.S. Seehra, I. Takeuchi and S.B. Majumder: Multiferroic properties of $\text{Pb}(\text{Zr,Ti})\text{O}_3/\text{CoFe}_2\text{O}_4$ composite thin films, *J. Appl. Phys. (Letter)*, 100, 126105 (3 pages), 2006.
220. G.C. Turpin, B.C. Dunn, E. Fillerup, Y. Shi, P. Dutta, V. Singh, M.S. Seehra, R.J. Pugmire, E.M. Eyring and R.D. Ernst: Gas-phase incorporation of Pd into ceria doped silica aerogel for water-gas-shift catalysis, *Proceedings 23rd Annual International Coal Conference 2006*, 13 pages.
221. M. S. Seehra, A. Kalra and A. Manivannan: Dewatering of fine coal slurries by selective heating with microwaves, *Fuel* 86, 829-834, 2007.
222. S.R. Das, R. Choudhary, P. Bhattacharya, R.S. Katiyar, P. Dutta, A. Manivannan and M.S. Seehra: Structural and multiferroic properties of La-modified BiFeO_3 ceramics, *J. Appl. Phys.* 101, 034104 (7 pages), 2007.
223. M.S. Seehra, S. Ranganathan and A. Manivannan: Carbon-assisted water electrolysis: an energy-efficient process to produce pure H_2 at room temperature, *Appl. Phys. Lett.* 90, 044104 (3 pages), 2007. Erratum: *Appl. Phys. Letters* 92, 239902(2008).
224. M.S. Seehra, P. Dutta, V. Singh, Y. Zhang and I. Wender: Evidence for room temperature ferromagnetism in $\text{Cu}_x\text{Zn}_{1-x}\text{O}$ from magnetic studies in $\text{Cu}_x\text{Zn}_{1-x}\text{O}/\text{CuO}$ composite, *J. Appl. Phys.* 101, 09H107 (3 pages) 2007.
225. P. Dutta and M.S. Seehra: Effect of DNA coating on magnetic relaxation in $\gamma\text{-Fe}_2\text{O}_3$ nanoparticles, *IEEE Trans. Magnetism* 43, 2468-2470 (2007).
226. S. Pal, P. Dutta, N. Shah, G.P. Huffman and M.S. Seehra: Surface spin disorder in Fe_3O_4 nanoparticles probed by electron magnetic resonance spectroscopy and magnetometry, *IEEE Trans. Magnetism* 43, 3091-3093 (2007).
227. P. Dutta, S. Pal, M.S. Seehra, M. Anand and C.B. Roberts: Magnetism in dodecanethiol-capped gold nanoparticles: Role of size and capping agent, *Appl. Physics Lett.* 90, 213102 (3 pages) 2007.
228. P. Dutta, F. Shi, Y. Zhang, I. Wender and M.S. Seehra: Characteristics of copper-based catalysts for methanol to H_2 conversion, *ACS Division of Fuel Chem.* 52(2), 467-468 (2007).
229. G.C. Turpin, B.C. Dunn, E. Fillerup, Y. Shi, P. Dutta, V. Singh, M.S. Seehra, E.M. Eyring, R.J. Pugmire and R.D. Ernst: Improved catalytic activity with gas-phase incorporated Pd on ceria for the water-gas shift reaction, Preprint paper, *ACS Division of Fuel Chem.* 52(2), 411-412 (2007).
230. M.S. Seehra, S. Bollineni, S. Ranganathan and P. Dutta: Effects of catalysts on carbon-assisted water electrolysis to produce H_2 at room temperature, Preprint paper, *ACS Division of Fuel Chemistry* 52(2), 457-458 (2007).
231. W. Shen, Y. Wang, X. Shi, N. Shah, F. Huggins, S. Bollineni, M.S. Seehra and G. Huffman: Catalytic non-oxidative dehydrogenation of ethane over Fe-Ni and Ni catalysts supported on $\text{Mg}(\text{Al})\text{O}$ to produce pure hydrogen and easily-purified carbon nanotubes, *Energy & Fuels* 21, 3520-3529 (2007).

232. N.P. Ortega, P. Bhattacharya, R.S. Katiyar, S.B. Majumdar, I. Takeuchi, P. Dutta, M.S. Seehra and A. Kumar: Effect of processing conditions on electrical and magnetic properties of $\text{Pb}(\text{Zr,Ti})\text{O}_3\text{-CoFe}_2\text{O}_4$ multilayer thin films, *Mater. Res. Soc. Symp. Proc. Vol. 1000*, L06-23 (6 pages) 2007.
233. P. Dutta, M.S. Seehra, S. Thota and J. Kumar: A comparative study of the magnetic properties of bulk and nanocrystalline Co_3O_4 , *J. Phys. Condens. Matter* 20, 015218 (8 pages) 2008.
234. H. Shim, P. Dutta, M.S. Seehra and J. Bonevich: Size dependence of the blocking temperature and electron magnetic resonance spectra in NiO nanoparticles, *Solid State Commun.* 145, 192-196 (2008).
235. L. Qi, S. Pal, P. Dutta, M.S. Seehra and M. Pei: Morphology controlled nanostructured Chitosan matrix and its cytocompatibility, *J. Biomedical Materials Research*, 87A, 236-244 (2008).
236. A. Chakraborty, A. Khan, P. Dutta and M.S. Seehra: Microwave characteristics of soft magnetic materials: FeZrN thin films and their dependence on nitrogen concentration, *Materials Letters* 62, 970-972 (2008).
237. M.S. Seehra, P. Dutta, S. Neeleshwar, Y. Chen, C.L. Chen, S.W. Chou, C.C. Chen, C. Dong and C. Chang: Size-controlled ex-nihilo ferromagnetism in capped CdSe quantum dots, *Advanced Materials*, 20, 1656-1660 (2008).
238. P. Dutta, M.S. Seehra, Y. Zhang and I. Wender: Nature of magnetism in copper doped oxides: ZrO_2 , TiO_2 , MgO , SiO_2 , Al_2O_3 and ZnO , *J. Appl. Phys.* 103, 07D104, (3 pages) 2008.
239. V. Singh, M.S. Seehra and J. Bonevich: Nickel-silica nanocomposite: Variation of the blocking temperature with magnetic field and measuring frequency, *J. Appl. Phys.* 103, 07D524 (3 pages) 2008.
240. S. Bali, G. Turpin, R. Ernst, R. Pugmire, V. Singh, M.S. Seehra and E. Eyring: Water-gas shift catalysis using iron aerogels and iron aerogels doped with Pd by the gas phase incorporation method, *Energy & Fuels*, 22, 1439-1443 (2008).
241. M. S. Seehra, S. Ranganathan and A. Manivannan: Electrochemical quantification of mercury in solutions using boron doped diamond electrodes: Electrode regeneration and role of gold and impurities, *Analytical Letters*, 41, 2162-2170 (2008).
242. F. E. Huggins, L.B.A. Seidu, N.Shah, G.P. Huffman, R. Q. Honaker, J. R. Kyger, B.L Higgins, J.D. Robertson, S. Pal and M. S. Seehra: Elemental modes of occurrence in an Illinois #6 coal and fractions prepared by physical separation techniques, *International, J. Coal Geology* 78,65-76(2009).
243. K. C. Mondal, O. Sengupta, P. Dutta, M. S. Seehra, S. K. Nayak and P. S. Mukherjee: Three-dimensional 3d-4f heterometallic polymers containing both azide and carboxylate as co-ligands, *Inorganica Chimica Acta*, 362, 1913-1917(2009).
244. P. Dutta, S. Pal and M. S. Seehra, N. Shah and G. P. Huffman: Size dependence of magnetic parameters and surface disorder in magnetite nanoparticles, *J. Appl. Phys.* 105, 07B501/1-3, (2009).
245. V. Singh, M. S. Seehra, and J. Bonevich: AC susceptibility studies of magnetic relaxation in nanoparticles of Ni dispersed in silica, *J. Appl. Phys.* 105, 07B518 /1-3, (2009).
246. M. S. Seehra and S. Bollineni: Nanocarbon boosts energy-efficient hydrogen production in carbon-assisted water electrolysis, *Int. J. Hydrogen Energy*. 34, 6078-6084 (2009).

247. C. Van Komen, A. Punnoose and M. S. Seehra: Transition from n-type to p-type destroys ferromagnetism in semiconducting $\text{Sn}_{1-x}\text{Co}_x\text{O}_2$ and $\text{Sn}_{1-x}\text{Cr}_x\text{O}_2$ nanoparticles, *Solid State Commun.* **149**, 2257-2259 (2009).
248. V. Singh and M. S. Seehra: Temperature and size dependence of electron magnetic resonance spectra of Ni nanoparticles embedded in amorphous SiO_2 matrix, *J. Phys: Condens Matter*, **21**, 456001/1-9, (2009).
249. M. S. Seehra, V. Singh, X. Song, S. Bali and E. M. Eyring: Synthesis, structure and magnetic properties of non-crystalline ferrihydrite nanoflakes, *J. Phys. Chem. Solids*, **71**, 1362-1366(2010).
250. J. D. Rall, M. S. Seehra, N. Shah and G. P. Huffman: Comparison of the nature of magnetism in $\alpha\text{-Ni(OH)}_2$ and $\beta\text{-Ni(OH)}_2$, *J. Appl. Phys.* **107**, 09B511/1-3, (2010).
251. M. S. Seehra, V. Singh, P. Dutta, S. Neeleshwar, Y. Y. Chen, C. L. Chen, S. W. Chou, and C. C. Chen: Size dependent magnetic properties of FCC FePt nanoparticles: Applications to magnetic hyperthermia, *J. Phys. D : Appl. Phys.* **43**, 145002/1-7, (2010).
252. M. S. Seehra, V. Singh, S. Thota, B. Prasad and J. Kumar: Synthesis and magnetic properties of nanocrystals of cubic defect spinel MgMnO_3 , *Applied Physics Letters*, **97**, 112507/1-3, (2010).
253. J. D. Rall, M. S. Seehra, and E. S. Choi: Metamagnetism and nanosize effects in the magnetic properties of quasi-2D system $\beta\text{-Ni(OH)}_2$, *Phys. Rev. B* **82**, 184403/1-9, (2010).
254. V. Singh, M. S. Seehra, F. E. Huggins, N. Shah, and G. P. Huffman: Temperature and size dependence of magnetic and electron magnetic resonance parameters of Fe nanoparticles embedded in amorphous SiO_2 matrix, *J. Appl. Phys.* **109**, 07B506/1-3, (2011).
255. V. Singh, M. S. Seehra, S. Bali, E. M. Eyring, N. Shah, F. E. Huggins and G. P. Huffman : Magnetic properties of $(\text{Fe}, \text{Fe-B})/\gamma\text{-Fe}_2\text{O}_3$ core-shell nanostructure, *J. Phys. Chem. Solids*. **72**, 1373-1376(2011).
256. M. S. Seehra and V. Singh : Use of microwave heating in coal research and in materials synthesis, book chapter in " Microwave Heating " (edited by U. Chandra, Intech Publishers, Croatia, 2011) pages 163-180. ISBN: 978-953-307-573-0.
257. M. S. Seehra, V. Singh, and S. Thota: Magnetic frustration and short range ordering in cubic defect spinel MgMnO_3 , *J. Appl. Phys.* **110**, 113907/1-4 (2011).
258. V. Singh, M. S. Seehra, A. Manivannan and P. N. Kumta: Magnetic characteristics of a new cubic defect spinel $\text{Li}_{0.5}\text{Mg}_{0.5}\text{MnO}_3$, *J. Appl. Phys.* **111**, 07E302/1-3, (2012).
259. J. D. Rall and M. S. Seehra: Nature of magnetism in the quasi-2D layered $\alpha\text{-Ni(OH)}_2$, *J. Phys.: Condens. Matter* , **24**, 076002/1-8, (2012).
260. M. S. Seehra, S. Suri and V. Singh : Effects of Cu doping on the magnetism of CeO_2 nanoparticles, *J. Appl. Phys.* **111**, 07B516/1-3, (2012).
261. N. Bykovetz, A. Hoser, J. Klein, C. L. Lin and M. S. Seehra : Neutron scattering measurements in RbMnF_3 : a test of spin wave region theories at low temperatures and critical behavior near T_N , *J. Appl. Phys.* **111**, 07E145/1-3, (2012).

262. M. S. Seehra, M. Yalamanchi and V. Singh: Structural characteristics and swelling mechanism of two commercial nitrile-butadiene elastomers in various fluids, *Polymer Testing*, **31**, 564-571 (2012).
263. D. Lederman, P. Dutta, M. S. Seehra and H. Shi: Interface biquadratic coupling and magnon scattering in exchange-biased ferromagnetic thin films grown on epitaxial FeF₂, *J. Phys.: Condens. Matter*, **24**, 186001/1-10, (2012).
264. M. S. Seehra, J. D. Rall, J. C. Liu and C. B. Roberts: Core-shell model for the magnetic properties of Pd nanoparticles, *Materials Letters*, **68**, 347-349 (2012).
265. S. Bali, G. Bali, F. Huggins, M. S. Seehra, V. Singh, J. Hancock, R. Harrison, G. Huffman, R. Pugmire, R. Ernst, and E. Eyring: Synthetic doped amorphous ferrihydrite for the Fischer-Tropsch synthesis of alternative fuels, *Industrial & Engg. Chemistry Research*, **51**, 4515-4522, (2012).
266. M. S. Seehra, L. P. Akkineni, M. Yalamanchi, V. Singh, and J. Poston : Structural characteristics of nanoparticles produced by hydrothermal pretreatment of cellulose and their applications for electrochemical hydrogen generation, *Intern. J. Hydrogen Energy*, **37**, 9514-9523, (2012),
267. J. D. Rall, S. Thota, J. Kumar and M. S. Seehra: Synthesis, structure and magnetic behavior of nanoparticles of cubic ZnMnO₃ , *Appl. Phys. Letters*, **100**, 252407/1-4, (2012).
268. C. Wang, S. Ravi, G. V. Martinez, V. Chinnasamy, P. Raulji, M. Howell, Y. Davis, M. S. Seehra and S. Mohapatra: Dual-purpose magnetic micelles for MRI and gene delivery, *J. Controlled Release*, **163**, 82-92, (2012)
269. D. B. Bacik, M. Zhang, D. Zhao, C. B. Roberts, M. S. Seehra, V. Singh and N. Shah: Green synthesis and characterization of supported polysugar stabilized Pd nanoparticle catalysts for enhanced hydro- dechlorination of trichloroethylene, *Nanotechnology*, **13**, 294004/1-13, (2012).
270. E. R. Kumar, R. Jayaprakash, M. S. Seehra, T. Prakash and S. Kumar: Effect of α -Fe₂O₃ phase on the structural, magnetic and dielectric properties of Mn-Zn ferrite nanoparticles, *J. Phys. Chem. Solids*, **74**, 943-949 (2013)
271. M. S. Seehra and A. B. Stefaniak: X-ray diffraction as a measurement tool for biodegradability of cellulose nanocrystals, Book Chapter in “ Production and Applications of Cellulose Nanomaterials” edited by M. T. Postek, R. J. Moon, A. W. Rudie and M. A. Bilodeau (TAPPI Press, Peachtree Corners, GA30092, 2013) pp 59-60.
272. S. Thota and M. S. Seehra: Co-existence of ferrimagnetism and spin-glass state in the spinel Co₂SnO₄, *J. Appl. Phys.* **113**, 203905/1-5, (2013).
273. M. S. Seehra and V. Singh: Magnetic ordering of nickel hydroxide layers 30 °A apart obtained by intercalating dodecyl sulfate, *J. Phys.:Condens. Matter*, **25**, 356001/1-7, (2013).
274. S. Thota, J. H. Shim and M. S. Seehra: Size-dependent shifts of the Neel temperature and optical band-gap in NiO nanoparticles, *J. Appl. Phys.* **114**, 214307/1-4, (2013).
275. T. R. Senty, M. Yalamanchi, Y. Zhang, S. K. Cushing, M. S. Seehra, X. Shi, and A. D. Bristow: Photoluminescence spectroscopy of YVO₄:Eu³⁺ nanoparticles with aromatic linker molecules: precursor to biomedical functionalization, *J. Appl. Phys.* **115**, 163107/1-5, (2014).

276. V. Narang, D. Korakakis and M.S. Seehra: Nature of magnetism and magnetic-field-induced transitions in non-collinear antiferromagnet Er_2O_3 , *J. Magn. Magn. Mater.* **368**, 353-359 (2014).
277. A. B. Stefaniak, M. S. Seehra, N. R. Fix and S. S. Leonard: Lung biodegradability and free radical production of cellulose nanomaterials, *Inhalation Toxicology*, **26**, 733-749 (2014).
278. M. S. Seehra, B. V. Popp, F. Goulay, S. K. Pyapalli, T. Gullion, and J. Poston: Hydrothermal treatment of microcrystalline cellulose under mild conditions: Characterization of solid and liquid-phase products, *Cellulose*, **21**, 4483-4495 (2014).
279. V. Narang, D. Korakakis and M. S. Seehra: Electronic state of Er in sputtered AlN:Er films determined by magnetic measurements: *J. Appl. Phys.* **116**, 213911/1-6 (2014).
280. K. Pisane, Sobhit Singh and M. S. Seehra: Synthesis, structural characterization and magnetic properties of Fe/Pt core-shell nanoparticles: *J. Appl. Phys.* **117**, 17D708/1-4 (2015).
281. K. Pisane, E. Despeaux, and M. S. Seehra: Magnetic relaxation and correlating effective magnetic moment with particle size distribution in maghemite nanoparticles, *J. Magn. Magn. Mater.* **384**, 148-154 (2015).
282. S. Thota, V. Narang, S. Nayak, S. Sambasivam, B. C. Choi, T. Sarkar, M. S. Andersson, R. Mathieu and M.S. Seehra: On the nature of the magnetic state in the spinel Co_2SnO_4 , *J. Phys.: Condens. Matter*, **27**, 166001(8pages), (2015).
283. M. S. Seehra, S. K. Pyapalli, J. Poston, E. Atta-Obeng, B. Dawson Andoh: Hydrothermal conversion of commercial lignin to carbonaceous materials: *J. Indian Acad. Wood Sci.* **12**, 29-36, (2015).
284. A. McDannald, L. Kuna, M. S. Seehra, and M. Jain: Magnetic exchange interactions of rare-earth substituted DyCrO_3 bulk powders: *Physical Review B* **91**, 224415/1-8, 2015.
285. Zhengjun Wang, Kelly L. Pisane, and M.S. Seehra: Magnetic determination of the electronic state of Cu and exchange interactions in the α - and β - phases of molecular semiconductor copper phthalocyanine ($\text{C}_{32}\text{H}_{16}\text{N}_8\text{Cu}$): *IEEE Trans. Magn.* **51** (11), 2700104/1-4, (2015).
286. D. Seifu, S. Neupane, L. Giri, S. P. Karna, H. Hong, and M. S. Seehra: Multilayered graphene acquires ferromagnetism in proximity with magnetite particles, *Appl. Phys. Lett.* **106**, 212401/1-5, (2015).
287. M. S. Seehra, Usha K. Geddam, D. Schwegler-Berry, and A. B. Stefaniak, Detection and quantification of 2H and 3R phases in commercial graphene-based materials, *Carbon*, **95**, 818-823, (2015).

288. S. Thota and M. S. Seehra: Co-existence of ferrimagnetism and spin-glass state in the spinel Co_2SnO_4 , Addendum and Erratum: J. Appl. Phys. **118**, 129901/1-2 (2015).
289. S. Nayak, S. Thota, D. C. Joshi, M. Krautz, A. Waske, A. Behler, J. Eckert, T. Sarkar, M. S. Andersson, K. Dasari, R. Palai, R. Mathieu, V. Narang and M. S. Seehra: Magnetic compensation, field-dependent magnetization reversal, and complex magnetic ordering in Co_2TiO_4 , Physical Review B **92**, 214434/1-10, 2015.
290. Z. Wang, M. Lee, E. S. Choi, J. Poston, and M. S. Seehra: Low temperature, high magnetic field investigations of the nature of magnetism in the molecular semiconductor β -Cobalt Phthalocyanine ($\text{C}_{32}\text{H}_{16}\text{CoN}_8$), J. Magn. Magn. Mater. **407**, 83-86 (2016).
291. M. S. Seehra and K. L. Pisane: Relationship between blocking temperature and strength of interparticle interaction in magnetic nanoparticle systems, J. Phys. Chem. Solids, **93**, 79-81 (2016).
292. Z. Wang and M. S. Seehra: Ising-like chain magnetism, Arrhenius magnetic relaxation, and case against 3D magnetic ordering in β -Manganese Phthalocyanine ($\text{C}_{32}\text{H}_{16}\text{MnN}_8$), Journal Phys.: Condens. Matter, **28**, 136002/9 pages, (2016).
293. J.R. Roberts, R. R. Mercer, A. B. Stefaniak, M. S. Seehra, U. K. Geddam, I. S. Chaudhuri, A. Kyrilidis, T. Sager, A. Kenyon, S. A. Bilgesu, T. Eye, J. F. Scabilloni, S. S. Leonard, N. R. Fix, D. Schwegler-Berry, B.Y. Farris, M. G. Wolfarth, D. W. Porter, V. Castranova, and A. Erdely: Evaluation of Pulmonary and Systemic Toxicity Following Lung Exposure to Graphite Nanoplates: A Member of the Graphene-based Nanomaterial Family, "Particle and Fibre Toxicology", **13**, 34, 2016 (22 pages)
294. A. McDannald, C. Dela Cruz, M. S. Seehra, and M. Jain: Negative exchange bias in single phase $\text{Dy}_{1-x}\text{Nd}_x\text{CrO}_3$ induced by Nd doping, Physical Review **B93**, 184430/1-8, (2016).
295. M. S. Seehra and V. Narang: Mesoporous carbons for energy-efficient water splitting to produce pure hydrogen at room temperature, book chapter in the open access book entitled "Microporous and Mesoporous Carbons" edited by R. S. Dariani (InTech Publishers, 8/2016, ISBN: 978-953-51-2582-2) pages 87-101.
296. Z. Wang, J. Poston, and M. S. Seehra: Diamagnetism of β -Nickel Phthalocyanine ($\text{C}_{32}\text{H}_{16}\text{N}_8\text{Ni}$) and Effects of Impurities, IEEE Magnetics Letters, **7**, 1406804/1-4, (2016).
297. D. Seifu, L. Giri, H. Hong, G. Mallick, S.P. Karna, and M. S. Seehra: Enhanced magnetic properties of carbon nanotubes and multilayer graphene decorated with Co_3O_4 , Proc. 16th Intern. Conf. Nanotechnology, Sendai, Jpn. (8-22-16 to 8-25-16), pages 587-590.
298. Zhengjun Wang, Li Pi, Mohindar S. Seehra, Jasleen Bindra, Hans van Tol and Naresh S. Dalal: Magnetic studies reveal near-perfect paramagnetism in the molecular semiconductor vanadyl phthalocyanine ($\text{C}_{32}\text{H}_{16}\text{N}_8\text{VO}$), J. Magn. Magn. Mater. **422**, 386-390 (2017).

299. M. S. Seehra, V. Narang, U.K. Geddam and A. B. Stefaniak, “Correlation between x-ray diffraction and Raman spectra of 16 commercial graphene-based materials, and their resulting classification, *Carbon*, **111**, 380-385 (2017).
300. S. Yin, T. Sauyet, M. S. Seehra, and M. Jain, “Particle size dependence of the magnetic and magneto-caloric properties of HoCrO_3 ”, *J. Appl. Phys.* **121**, 063902/1-11, (2017).
301. Z. Wang and M. S. Seehra, Magnetic investigations of phase transitions, exchange interactions, and magnetic ground state in nanosheets of $\beta\text{-Co(OH)}_2$, *J. Phys.: Condensed Matter*, **29**, 225803(9 pages), 2017.
302. Shiqi Yin, Mohindar. S. Seehra, Curtis J. Guild, Steven L. Suib, Narayan Poudel, Bernd Lorenz, and Menka Jain, “Magnetic and magneto-caloric properties of HoCrO_3 tuned by selective rare-earth doping”, *Physical Review B*, **95**, 184421 (12 pages), 2017.
303. K. L. Pisane, Sobhit Singh, and M. S. Seehra, “Unusual enhancement of effective magnetic anisotropy with decreasing particle size in maghemite nanoparticles, *Appl. Phys. Letters*. **110**, 222409(5 pages), 2017.
304. Zhengjun Wang, Konstantinos Sierros, Mohindar S. Seehra, and Dimitris Korakakis, “Development of indigo-based nonvolatile write-once-read-many-times memory Device, *Materials Letters*, **206**, 128-131 (2017).
305. Sobhit Singh, Kelly. L. Pisane, and Mohindar. S. Seehra, “A core-shell-surface layer model to explain the size dependence of effective magnetic anisotropy in magnetic nanoparticles” *Proc. 17th IEEE International Conf.on Nanotechnology*, Pittsburgh, USA (July 25-28,2017) pp 2014-2018.
306. Prativa Pramanik, Subhash Thota, Sobhit Singh, Deep Chandra Joshi, Bruno Weise, Anja Waske and M. S. Seehra, “Effects of Cu doping on the electronic structure and magnetic properties of MnCo_2O_4 ”, *J. Phys.: Condensed Matter*, **29**, 425803(13 pages) 2017.
307. E. Atta-Obeng, B. Dawson-Andoh, M. S. Seehra; Usha Geddam; J. Poston and J. Leisen, "Physico-chemical characterization of carbons produced from technical lignin by sub-critical hydrothermal carbonization" *Biomass & Bioenergy*, **107**, 172-181 (2017).
308. N. Mottaghi, M. S. Seehra, R. Trappen, S. Kumari, Chih-Yeh Huang, S. Yousefi, G. B. Cabrera, A. H. Romero and M. B. Holcomb: “Insights into the magnetic dead layer in $\text{La}_{0.07}\text{Sr}_{0.3}\text{MnO}_3$ thin films from temperature, magnetic field and thickness dependence of their Magnetization”, *AIP Advances* **8**, 056319 (6 pages) 2018.
309. H.Verma, D. Seifu, S. P. Karna, H. Hong, and M.S. Seehra, “Induced ferromagnetism in multilayered graphene in proximity with CoFe_2O_4 ”, *AIP Advances* **8**, 025119 (8 pages) 2018.
310. P. Pramanik, Sobhit Singh, D.C. Joshi, A. Mallick, K. Pisane, A. H. Romero, S. Thota, and M. S. Seehra: “Cubic Phase Stability, Optical and Magnetic Properties of Cu-doped Zirconia Nanocrystals”, *J. Phys. D: Appl. Phys.* **51**, 225304(12 pages) 2018.

311. Jianhang Shi, Shiqi Yin, Mohindar S. Seehra and Menka Jain, “Enhancement in magnetocaloric properties of ErCrO_3 via A-site Gd substitution”, *J. Appl. Phys.* **123**,193901(9 pages) 2018.
312. E. Ranjith Kumar, Ch. Srinivas, M. S. Seehra, M. Deepty, A.S. Kamzin, M. V. K. Mehar, N. Krishna Mohan, “Particle size dependence of the magnetic, dielectric and gas sensing properties of Co substituted NiFe_2O_4 nanoparticles”, *Sensors & Actuators A*: **279**, 10-18 (2018).
313. M. S. Seehra and A.D. Bristow, Overview of the properties and applications of noble and precious metals, Introductory chapter in the book ‘Noble and Precious Metals- Properties, Nanoscale Effects and Applications’ edited by M. S. Seehra and A.D. Bristow; ISBN: 978-1-78923-292-9 (Intech Publishers, London, UK 2018) pages 3-11.
314. N. Mottaghi, R. Trappen, S. Kumari, C. Huang, S. Yousefi, G. Cabrera, M. Aziziha, A. Haertter, M. Johnson, M. S. Seehra, and M. Holcomb, "Observation and interpretation of negative remanent magnetization and inverted hysteresis loops in a thin film of $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3$, *J. Phys.: Condens. Matter*, **30**, 405804(6 pages), 2018.
315. M. Aziziha, R. Beesley, J. Magers, N. Mottaghi, M.B. Holcomb, J. P. Lewis, M. S. Seehra, and M. B. Johnson “Electronic state and concentration of Fe in $\text{CuAl}_{1-x}\text{Fe}_x\text{O}_2$ determined by magnetic measurements”, *J. Magn. Magn. Mater.* **471**, 495-500 (2019).
316. M. Aziziha, S. A. Byard, R. Beesley, J. P. Lewis, M. S. Seehra, and M.B. Johnson “Magnetic properties of Fe-doped CuAlO_2 and role of impurities, *AIP Advances*, **9**, 035030 (5 pages), 2019.
317. P. Pramanik, S. Ghosh, P. Yanda, D. C. Joshi, S. Pittala, A. Sundaresan, P. K. Mishra, S. Thota, and M. S. Seehra, “Magnetic Ground-State, Field-Induced Transitions, Electronic Structure and Optical Bandgap of the Magnetically Frustrated Antiferromagnet GeCo_2O_4 , *Phys. Rev. B* **99**, 134422(12 pages) 2019.
318. M. Aziziha, S. Akbarshahi, S. Ghosh, P. Pramanik, J. P. Lewis, A. H. Romero, S. Thota, M. S. Seehra, and M. B. Johnson: “Phonon Dynamics in Anisotropic Dilute $\text{CuAl}_{1-x}\text{Fe}_x\text{O}_2$ Delafossite Alloys by a Weighted Dynamical Matrix Approach”, *J. Phys. Chem. C*, **123**(50),30604-30612,2019.
319. S. Ghosh, S. K. Jena, P. K. Mishra, M. S. Seehra, and S. Thota, “Magnetic exchange interactions and band gap bowing in $\text{Ni}_x\text{Mg}_{1-x}\text{O}$ ($0 \leq x \leq 1$): A GGA+*U* density functional study”, *J. Appl. Phys.* **126**, 233904 (10 pages), 2019.
320. N. Mottaghi, R. B. Trappen, S. Y. Sarraf, M. S. Seehra, M. B. Holcomb, “Magnetocaloric investigations show magnetic inhomogeneity in a 7.6 nm thin film of $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3/\text{SrTiO}_3$ ”, *Journal of Alloys and Compounds*, **826**, 154200 (6 pages), 2020.
321. Shalini Kumari, N. Mottaghi, Chih-Yeh Huang, R. Trappen, G. Bhandari, S. Yousefi, G. Cabrera, M. S. Seehra, and M. B. Holcomb, “Effects of Oxygen Modification on the Structural and Magnetic Properties of Highly Epitaxial $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3$ (LSMO) thin films”, *Scientific Reports*, **10**, 1-11, 2020.

322. Navid Mottaghi, Mohindar S. Seehra, Jianhang Shi, Menka Jain and Mikel B.Holcomb, “Spin dynamics and relaxation in 7.6 nm thin film of $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3/\text{SrTiO}_3$: ac magnetic susceptibility and magnetic viscosity investigations”. J. Appl. Phys. **128**, 073903 (8 pages), 2020.
323. Sayandeep Ghosh, Deep Chandra Joshi, Prativa Pramanik, Suchit K Jena, Suresh Pittala, Tapati Sarkar, Mohindar S Seehra and Subhash Thota, “Antiferromagnetism, Spin-Glass State, H-T Phase Diagram, and Inverse Magnetocaloric Effect in Co_2RuO_4 ”, J. Phys.: Condens. Matter, **32**, 485806(13pages), 2020.
324. N. Rajeeshkumar, R.Kalai Selvan, Leonid Vasylechko, P.Saravanan, and Mohindar S. Seehra, “Exchange interactions and the nature of magnetic ordering in $\text{Zn}_{0.6}\text{Mn}_{2.4}\text{O}_4$ particles”, Physica B **599**,412460 (8pages),2020.
325. Jianhang Shi, Theodore Sauyet, Yanliu Dang, Steven L. Suib, Mohindar S. Seehra, and Menka Jain, “Effects of particle size and structural parameters on the magnetic and magnetocaloric properties of GdCrO_3 nanoparticles”, Phys. Rev. B (submitted, under review).