

## REFERENCES

1. Aleksandra B. Djuricic, Yan Y. Xi, Yan F. Hsu and Wai K. Chan “Hydrothermal Synthesis of Nanostructures”, *Recent Patents on Nanotechnol.*, Vol. 1, No. 2, pp. 121-128, 2007.
2. Anders Hagfeldt and Michael Graetzel “Light-Induced Redox Reactions in Nanocrystalline Systems”, *Chem. Rev.*, Vol. 95, No. 1, pp. 49-68, 1995.
3. Arivazhagan, V., Manonmani Parvathi, M. and Rajesh, S. “Photoluminescence analysis on vacuum deposited PbSe multilayer thin films”, *Arch. Phys. Res.*, Vol. 2, No. 1, pp. 48-53, 2011.
4. Arul Dhas, N. and Gedanken, A. “A sonochemical approach to the surface synthesis of cadmium sulfide nanoparticles on submicron silica”, *Appl. Phys. Lett.*, Vol. 72, No. 20, pp. 2514-2516, 1998.
5. Baolong Yu, Guosheng Yin, Congshan Zhu and Fuxi Gan “Optical nonlinear properties of PbS nanoparticles studied by the Z-scan technique”, *Opt. Mater.*, Vol. 11, pp. 17-21, 1998.
6. Barlow, F., Elshabini-Riad A. and Brown, R. “Film deposition techniques and processes”, New York, McGraw Hill, 1998.
7. Batonneau, Y., Brémard, C., Laureyns, J. and Merlin, J. C. “Microscopic and imaging Raman scattering study of PbS and its photo-oxidation products”, *J. Raman Spectrosc.*, Vol. 31, No. 12, pp. 1113-1119, 2000.
8. Bhargava R. (Ed.) “Properties of Wide Bandgap II-VI Semiconductors”, INSPEC Publications, London, 1997.
9. Bhavana Godbole, Nitu Badera, Shrivastav, S. B. and Ganesan, V. “A simple chemical spray pyrolysis apparatus for thin film preparation”, *Jl. of Instrum. Soc. of India*, Vol. 39, No. 1, pp. 42-45, 2009.

10. Brajesh K. Rai, Bist, H.D., Katiyar, R.S., Nair, M.T.S., Nair, P.K and Mannivannan, A. "Simultaneous observation of strong and weak quantum confinement effect in chemically deposited CdSe thin films: A spectro structural study", J. Appl. Phys., Vol. 82, Issue 3, pp. 1310-1319, 1997.
11. Bunshah, R. F. "Handbook of Deposition Technologies for Films and Coatings", Noyes Publications Mill Road, Park Ridge, New Jersey 07656, 1994.
12. Byrappa, K. "Hydrothermal Growth of Crystal", Pergamon, Oxford 1991.
13. Byrappa, K. and Masahiro Yoshimura, "Handbook of hydrothermal technology: a technology for crystal growth and materials processing", William Andrew Publishing/Noyes, 2001.
14. Carlsson, J. "Chemical Vapour Deposition-Handbook of Deposition Technologies for Films and Coatings", Noyes Publications Mill Road, Park Ridge, New Jersey 07656, 1994.
15. César A. Estrada, Nair, P. K., Nair, M. T. S., Ralph A. Zingaro and Edward A. Meyers "Chemical Bath Deposition of ZnSe and CuSe Thin Films Using N, N-Dimethylselenourea", J. Electrochem. Soc., Vol. 141, Issue 3, pp. 802-806, 1994.
16. Chate, P. A., Hankare, P. P and Sathe, D. J. "Characterization of cadmium selenide films for photovoltaic applications", J. Alloys Compd. Vol. 505, Issue 1, pp. 140-143, 2010.
17. Chopra, K. L. "Thin Film Phenomena", McGRAW-Hill Book Company Inc., New York, 1969.
18. Chopra, K. L. and Das, S. R. "Thin Film Solar Cells", Springer publications, Plenum Press, New York, 1983.
19. Cockyane, B. and Wright, P. J. "Metal organic chemical vapour deposition of wide band gap II-VI compounds", J. Cryst. Growth, Vol. 68, Issue 1, pp. 223-230, 1984.
20. Conyers Herring and Galt, J. K. "Elastic and Plastic Properties of Very Small Metal Specimens", Phys. Rev., Vol. 85, Issue 6, pp. 1060-1061, 1952.

21. Cun Li, Guang Shi, Hongyao Xu, Shanyi Guang, Ronghui Yin and Yinglin Song "Nonlinear optical properties of the PbS nanorods synthesized via surfactant-assisted hydrolysis", *Mater. Lett.*, Vol. 61, pp. 1809-1811, 2007.
22. Daniel J. Asunskis, Igor L. Bolotin and Luke Hanley "Nonlinear Optical Properties of PbS Nanocrystals Grown in Polymer Solutions", *J. Phys. Chem. C*, Vol. 112, No. 26, pp. 9555-9558, 2008.
23. David Lide, R. "CRC Handbook of Chemistry and Physics", 84 ed., CRC Press, Boca Raton, FL, 2004.
24. Donald M. Mattox "Handbook of Physical Vapour Deposition (PVD) Processing", New York, William Andrew Inc, 1998.
25. Elango, T., Subramanian, V. and Murali, K. R. "Characteristics of spray-deposited CdSe thin films", *Surf. Coat. Tech.*, Vol. 123, Issue 1, pp. 8-11, 2000.
26. El-Ocker, M. M., Sharaf, F., Yossef, S. M., Metawe, F. and El-Desou, M. "Optical behaviour of lead selenide films", *Phys. Stat. Sol. (b)*, Vol. 167, No.1, pp. 609-614, 1990.
27. Enue Barrios-Salgado, Nair, M. T. S., Nair, P. K. and Ralph A. Zingaro "Chemically deposited thin films of PbSe as an absorber component in solar cell structures", *Thin Solid Films*, Vol. 519, Issue 21, pp. 7432-7437, 2011.
28. Erat, S., Metina, H. and Ari, M. "Influence of the annealing in nitrogen atmosphere on the XRD, EDX, SEM and electrical properties of chemical bath deposited CdSe thin films", *Mater. Chem. Phys.*, Vol.111, Issue 1, pp. 114-120, 2008.
29. Gao, Y. Zhang, X. Li, Y. Liu, H. Wang, Y. Chang, Q. Jiao, W. and Song, Y. "Saturable absorption and reverse saturable absorption in platinum nanoparticles", *Opt. Commun.*, Vol. 251, pp. 429-433, 2005.
30. Glew, R. W. "Cadmium selenide sputtered films", *Thin Solid Films* Vol.46, Issue 1, pp. 59-67, 1977.
31. Goswami, A. "Thin Film Fundamentals", New Age International Pvt Ltd Publishers, 2008.

32. Goto, F., Ichimura, M. and Arai, E. "A new technique of compound semiconductor deposition from an aqueous solution by photochemical reactions", *Jpn. J. Appl. Phys.*, Vol. 36, No.9A/B, pp. L1146-L1149, 1997.
33. Gray Hodes "Chemical Solution Deposition of Semiconductor Films", Marcel Dekker, New York, 2003.
34. Gregory D. Smith, Steven Firth, Robin J. H. Clark and Manuel Cardona, "First- and second-order Raman spectra of galena (PbS)", *J. Appl. Phys.*, Vol. 92, pp. 4375-4380, 2002.
35. Gunasekaran, M., Gopalakrishnan, R. and Ramasamy, P. "Deposition of ZnS thin films by photochemical deposition technique", *Mater. Lett.*, Vol. 58, pp. 67-70, 2003.
36. Hernandez-Perez, M. A., Aguilar-Hernandez, J., Contreras-Puente, G., Vargas-García, J. R. and Rangel-Salinas, E. "Comparative optical and structural studies of CdSe films grown by chemical bath deposition and pulsed laser deposition", *Physica E*, Vol. 40, Issue 7, pp. 2535-2539, 2008.
37. Herrero, J., Gutierrez, M.T., Guillén, C., Donaña, J.M., Martínez, M.A., Chaparro, A.M. and Bayo, R. "Photovoltaic windows by chemical bath deposition", *Thin Solid Films*, Vol. 361-362, No.1-2, pp. 28-33, 2000.
38. Hiroshi Uda, Hideo Yonezawa, Yoshikazu Ohtsubo, Manabu Kosaka, Hajimu Sonomura "Thin CdS films prepared by metal organic chemical vapour deposition", *Sol. Energy Mater. Sol. Cells*, Vol. 75, pp. 219-226, 2003.
39. Hitchman, M. L. and Jensen, K. F. "Chemical vapour deposition: principles and applications", New York, Academic Press Ltd, 1993.
40. Howard M. Smith and Turner, A. F. "Vacuum Deposited Thin Films Using a Ruby Laser", *Appl. Opt.*, Vol. 4, Issue 1, pp. 147-148, 1965.
41. Huaqiang Cao, Guozhi Wang, Sichun Zhang and Xinrong Zhang "Growth and photoluminescence properties of PbS nanocubes", *Nanotechnology*, Vol. 17, pp. 3280-3287, 2006.
42. Humphreys, F. J. and Hatherly, M. "Recrystallization and related Annealing Phenomena" (Second edition), Elsevier Ltd., 2004.

43. Husain, M., Beer Pal Singh, Sushil Kumar, Sharma, T.P. and Sebastian, P.J. "Optical, electrical and structural investigations on  $\text{Cd}_{1-x}\text{Zn}_x\text{Se}$  sintered films for photovoltaic applications" *Sol. Energy Mater. Sol. Cells* Vol. 76, Issue 3, pp. 399-415, 2003.
44. Ibrahim, M. M., Saleh, S. A., Ibrahim, E. M. M. and Abdel Hakeem, A. M. "Electrical and thermoelectric properties of PbSe doped with Sm.", *J. Alloys Compd.*, Vol. 452, Issue 2, pp. 200-204, 2008.
45. Ichimura, M., Goto, F. and Arai, E. "Structural and optical characterization of CdS films grown by photochemical deposition", *J. Appl. Phys.*, Vol. 85, No. 10, pp. 7411-7417, 1999.
46. Ichimura, M., Kobayashi, R., Miyawaki, T. "Photochemical Deposition of ZnS Thin Films by Intermittent Illumination", *Jpn. J. Appl. Phys.*, Vol. 43, No. 9A/B, pp. L1196-L1198, 2004.
47. Ichimura, M., Narita, T. and Masui, K. "Synthesis of PbS in aqueous solutions by photochemical reactions", *Mater. Sci. Eng. B.*, Vol. 96, No. 3, pp. 296-299, 2002.
48. Ichimura, M., Sato, N., Nakamura, A., Takeuchi, K. and Arai E., "Properties of Photochemically Deposited CdSe Films", *phys. Stat. Sol. (a)*, Vol. 193, pp. 132-138, 2002a.
49. Ilan Jen-La Plante, Tahani W. Zeid, Peidong Yang and Taleb Mokari, "Synthesis of metal sulfide nanomaterials via thermal decomposition of single-source precursors", *J. Mater. Chem.*, Vol. 20, No. 32, pp. 6612-6617, 2010.
50. Jaime M. Martiny, Jose Luis Hernandezy, Lucia Adellyz, Acacio Rodriguezy and FLopez "Arrays of thermally evaporated PbSe infrared photodetectors deposited on Si substrates operating at room temperature", *Semicond. Sci. Technol.*, Vol. 11, pp. 1740-1744, 1996.
51. Jef Poortmans and Vladimir Arkhipov "Thin Film Solar Cells: Fabrication, Characterization and Applications", Wiley Series, 2006.
52. John A. Venables "Introduction to surface and thin film processes", Cambridge, Cambridge University Press, 2000.
53. Junjie Zhu, Xuehong Liao, Xiaoning Zhao and Jun Wang "Photochemical synthesis and characterization of CdSe nanoparticles", *Mater. Lett.*, Vol. 47, Issue 6, pp. 339-343, 2001.

54. Kale, R. B. and Lokhande, C. D. "Band gap shift, structural characterization and phase transformation of CdSe thin films from nanocrystalline cubic to nanorod hexagonal on air annealing", *Semicond. Sci. Technol.*, Vol. 20, No. 1, pp. 1-9, 2005.
55. Kale, S.S and Lokhande, C.D. "Thickness dependent properties of chemically deposited CdSe thin films", *Mater. Chem. Phys.*, Vol. 62, Issue 2, pp. 103-108, 2000.
56. Karolina P. Fritz, Serap Guenes, Joseph Luther, Sandeep Kumar, N., Serdar Sariciftci and Gregory D. Scholes "IV-VI Nanocrystal-polymer solar cells", *J. Photochem. Photobiol. A.*, Vol. 195, pp. 39-46, 2008.
57. Kassim, A., Ho S.M., Abdullah, A.H. and Nagalingam, S., "XRD, AFM and UV-Vis Optical Studies of PbSe Thin Films Produced by Chemical Bath Deposition Method", *Transactions C: Chemistry and Chemical Engineering*, Vol. 17, No. 2, pp. 139-143, 2010.
58. Khokhlov, D. "Lead Chalcogenides Physics and Applications", Taylor and Francis Books, Inc., London, 2003.
59. Kurtis S. Leschkies, Timothy J. Beatty, Moon Sung Kang, David J. Norris and Eray S. Aydi "Solar Cells Based on Junctions between Colloidal PbSe Nanocrystals and Thin ZnO Films", *Nano*, Vol. 3, No.11, pp 3638-3648, 2009.
60. Li, B., Xie, Y., Huang, J., Liu, Y. and Qian, Y. "A novel method for the preparation of III-V semiconductors: Sonochemical synthesis of InP nanocrystals", *Ultrason. Sonochem.*, Vol. 8, Issue 4, pp. 331-334, 2001.
61. Lifei Xi, Yeng Ming Lam, Yan Ping Xu and Lain-Jong Li "Synthesis and characterization of one-dimensional CdSe by a novel reverse micelle assisted hydrothermal method", *J. Colloid Interface Sci.*, Vol. 320, pp. 491-500, 2008.
62. Lin Xu, Xiaoyan Yang, Zheng Zhai, Xing Chao, Zihui Zhang and Wenhua Hou "EDTA-mediated hydrothermal synthesis of NaEu(MoO<sub>4</sub>)<sub>2</sub> microrugbies with tunable size and enhanced luminescence properties", *Cryst. Eng. Comm.*, Vol. 13, No. 15, pp. 4921-4929, 2011.
63. Lokhande, C. D., Ubale, A. U and Patil, P. S. "Thickness dependent properties of chemically deposited Bi<sub>2</sub>S<sub>3</sub> thin films", *Thin Solid Films* Vol. 302, No. 1-2, pp. 1-4, 1997.

64. Lokhnade, C. D. "Chemical deposition of metal chalcogenide thin films" *Mater. Chem. Phys.*, Vol. 27, Issue 1, pp. 1-43, 1991.
65. Ma, D. W. and Cheng, C. "Preparations and characterizations of polycrystalline PbSe thin films by a thermal reduction method, *J. Alloys Compd.*, Vol. 509, Issue 23, pp. 6595-6598, 2011.
66. Madelung, O. "Semiconductor: Data Handbook", 3<sup>rd</sup> ed., Springer, Berlin, 2003.
67. Mane, R. S. and Lokhande, C. D. "Chemical deposition method for metal chalcogenide thin films", *Mater. Chem. Phys.*, Vol. 65, No. 1, pp. 1-31, 2000.
68. Mane, R.S. and Lokhande, C. D. "Studies on chemically deposited cadmium sulphoselenide (CdSSe) films", *Thin Solid Films* Vol. 304, Issue 1-2, pp. 56-60, 1997.
69. Marandi, M., Taghavinia, N., Iraj Zad, A. and Mahdavi, S. M. "A photochemical method for controlling the size of CdS nanoparticles", *Nanotechnology*, Vol.16, No. 2, pp. 334-338, 2005.
70. Mary D. Archer and Arthur J Nozik, "Nanostructured and Photo electrochemical Systems for Solar Photon Conversion", Vol. 3, Imperial College Press, London, 2008.
71. Massimo F Bertino, Raghuveer R Gadipalli, Lane A Martin, Lauren E Rich, Alexey Yamilov, Brian R Heckman, Nicholas Leventis, Suchi Guha, John Katsoudas, Ralu Divan and Derrick Cmancini, "Quantum dots by ultraviolet and x-ray lithography", *Nanotechnology*, Vol. 18, pp. 315603-315609, 2007.
72. Milan Paunovic and Mordechai Schlesinger "Fundamentals of electrochemical deposition", Wiley Interscience, A John Wiley & Sons, INC., Publication, 2006.
73. Moriya, K., Tanaka, K. and Uchiki H. "Characterization of Cu<sub>2</sub>ZnSnS<sub>4</sub> Thin Films Prepared by Photochemical Deposition", *Jpn. J. Appl. Phys.*, Vol. 44, No. 1B, pp. 715-717, 2005.
74. Muñoz, A., Meléndez, J., Torquemada, M. C., Rodrigo, M. T., Cebrián, J., de Castro, A. J., Meneses, J., Ugarte, M., López, F., Vergara, G., Hernández, J. L., Martín, J. M., Adell, L. and Montojo, M. T., "PbSe photodetector arrays for IR sensors", *Thin Solid Films*, Vol. 317, pp. 425-428, 1998.

75. Murali, K.R., Subramanian, V., Rangarajan, N., Lakshmanan, A. S. and Rangarajan, S.K., "Photoelectrochemical studies on pulse plated CdSe films", *J. Electroanal. Chem. Interfacial Electrochem.*, Vol. 303, Issue 1-2, pp. 261-266, 1991.
76. Nair, M.T.S., Nair, P.K., Ralph, A. Zingaro and Edward A. Meyers, "Enhancement of photosensitivity in chemically deposited CdSe thin films by air annealing", *J. Appl. Phys.*, Vol. 74, No. 3, pp. 1879-1884, 1993.
77. Nanda, K. K., Sahu, S. N., Soni R. K. and Tripathy S., "Raman spectroscopy of PbS nanocrystalline semiconductors", *Phys. Rev. B.*, Vol. 58, pp. 15405-15407, 1998.
78. Niyazi, F., Savenkova, I., Burykina, O. V. and Zaikov, G. E. "Photochemical Reactions in Heterochain Polymers, Nova Science Publishers", Inc. New York, 2008.
79. Padmavathy, R., Rajesh, N. P., Arulchakkaravarthi, A., Gopalakrishnan R., Santhanaraghavan, P. and Ramasamy, P. "Enhancement of photochemical deposition (PCD) and analysis of surface spread of CdS crystalline thin films", *Mater. Lett.*, Vol. 53, Issue 4-5, pp. 321-325, 2002.
80. Pathinettam Padiyan, D., Marikani, A. and Murali, K. R., Influence of thickness and substrate temperature on electrical and photoelectrical properties of vacuum-deposited CdSe thin films", *Mater. Chem. Phys.* Vol. 78, Issue 1, pp. 51-58, 2002.
81. Podder, J., Kobayashi, R. and Ichimura, M. "Photochemical deposition of  $\text{Cu}_x\text{S}$  thin films from aqueous solutions", *Thin Solid Films*, Vol. 472, Issue 1-2, pp. 71-75, 2005.
82. Podder, J., Miyawaki, T. and Ichimura, M. "Preparation and characterization of  $\text{CuInS}$  thin films from aqueous solutions by novel photochemical deposition technique", *J. Cryst. Growth*, Vol. 275, No. 1-2, pp. e937-e942, 2005a.
83. Prabahar, S., Suryanarayanan N., Rajasekar K. and Srikanth S. "Compositional and Electrical Resistivity Studies on Thermal Evaporation Lead Selenide Thin Films", *Chalcogenide Letters*, Vol. 6, pp. 227-232, 2009.



84. Pradip KR. Kalita, Sarma, B. K. and Das, H. L. "Space charge limited conduction in CdSe thin films", *Bull. Mater. Sci.*, Vol. 26, Issue 6, pp. 613-617, 2003.
85. Raman, C. V. and Krishnan, K. S. "A New Type of Secondary Radiation", *Nature*, Vol. 121, pp. 501-502, 1928.
86. René Guinebretière, "X-ray Diffraction by Polycrystalline Materials", ISTE Ltd, 2007.
87. Richard Brundle, C., Charles A. Evans Jr. and Sbaun Wihon, "Encyclopaedia of Materials Characterization", Butterworth-Heinemann Boston London Oxford Singapore Sydney Toronto Wellington, 1992.
88. Richard W. Siegel, Evelyn Hu and Roco, M.C., "R & D status and trends in nanoparticles, nanostructured materials and nanodevices in the united states" Proceedings of the May 8-9, 1997 Workshop, Boston, Kluwer, Academic Publishers, 1997.
89. Roberts, D. H. and Baines, J. E. "Photoconductivity in chemically deposited films of lead selenide", *J. Phys. Chem. Solids*, Vol. 6, No. 2-3, pp. 184-189, 1958.
90. Robin F. Farrow, "Molecular beam epitaxy: applications to key materials", William Andrew Inc, New York, 1996.
91. Rossnagel, S., "Sputtering and Sputter Deposition, Handbook of Thin-Film Deposition Processes and Techniques", Principles, Methods, Equipment and Applications, 2<sup>nd</sup> Edition, William Andrew Publishing/Noyes, 2002.
92. Rowe D. M., "CRC Handbook of Thermoelectrics", CRC Press, Boca Raton, Florida, USA, 1995.
93. Roy, R. K., Bhattacharyya, S. R., Bandyopadhyay, S. and Pal, A. K., "Optical properties of nanocrystalline gallium nitride films", *Thin Solid Films*, Vol. 500, Issue 1-2, pp. 144-151, 2006.
94. Salim, S. M. and Hamid, O. "Growth and characterization of lead sulfide films deposited on glass substrates", *Renewable Energy*, Vol. 24, Issue 3-4, pp. 575-580, 2001.
95. Sarmah, K. Sarma, R. and Das, H. L. "Structural Characterization of Thermally Evaporated CdSe Thin Films", *Chalcogenide Letters*, Vol. 5, pp. 153-163, 2008.

96. Sasha Gorer, Ana Albu-Yaron and Gary Hodes “Quantum Size Effects in Chemically Deposited, Nanocrystalline Lead Selenide Films”, *J. Phys. Chem.*, Vol. 99, No. 44, pp. 16442-16448, 1995.
97. Schroder Dieter K. “Semiconductor Material and Device Characterization”, 2<sup>nd</sup> Edition, John Wiley & Sons, New York, 1998.
98. Serap Gunes, Karolina P. Fritz, Helmut Neugebauer, Niyazi Serdar Sariciftci, Sandeep Kumar and Gregory D. Scholes, “Hybrid solar cells using PbS nanoparticles”, *Sol. Energy Mater. Sol. Cells*, Vol. 91, No. 5, pp. 420-423, 2007.
99. Sherman A. “Plasma-Assisted Vapour Deposition Processes: Handbook of Deposition Technologies for Films and Coatings”, Noyes Publications Mill Road, Park Ridge, New Jersey 07656, 1994.
100. Sivakumar, R., Gopalakrishnan, R., Jayachandran, M. and Sanjeeviraja C. “Characterization on electron beam evaporated a-MoO<sub>3</sub> thin films by the influence of substrate temperature”, *Curr. Appl. Phys.*, Vol. 7, Issue 1, pp. 51-59, 2007.
101. Smith, D.L, “Thin film deposition: principles and practice”, New York: McGraw-Hill Inc, 1995.
102. Soumyendu Guha, Valerie J. Leppert, Subhas H. Risbud and Inuk Kang, “Observation of excitonic states in PbSe nanocrystals”, *Solid State Commun.*, Vol. 105, pp. 695-699, 1998.
103. Stanley Middleman “An Introduction to Fluid Dynamics: Principles of Analysis and Design” Univ. of California, San Diego, John Wiley and Sons, New York, 1998.
104. Stokes, A. R. and Wilson, A. J. C. “The diffraction of X-rays by distorted crystal aggregates-I”, *Proc. Phys. Soc.*, Vol. 56, pp. 174-181, 1944.
105. Sudharsanana, R. and Rohatgi, A. “Investigation of metal organic chemical vapour deposition grown CdTe/CdS solar cells”, *Solar Cells*, Vol. 31, Issue 2, pp. 143-150, 1991.
106. Suthan Kissinger, N. J., Jayachandran, M., Perumal, K. and Sanjeeviraja, C. “Structural and optical properties of electron beam evaporated CdSe thin films”, *Bull. Mater. Sci.*, Vol. 30, No. 6, pp. 547-551, 2007.

107. Svein Espevik, Chen-ho Wu and Richard H. Bube, "Mechanism of Photoconductivity in Chemically Deposited Lead Sulphide Layers", *J. Appl. Phys.*, Vol. 42, No. 9, pp. 3513-3529, 1971.
108. Tamilselvan, V., Kishore Sridharan, Narasimha Rao, K. and Reji Philip, "Optical nonlinearity in lead sulphide microtowers", *J. Phys. D: Appl. Phys.*, Vol. 43, pp. 385402-385407, 2010.
109. Terra, F. S., Mahmoud, G. M., Nasr, M. and EI Okr, M. M. "Preparation and structural properties of PbSe nanomaterials", *Surf. Interface Anal.*, Vol. 42, pp. 1239-1243, 2010.
110. Timothy H. Gfroerer "Photoluminescence in Analysis of Surfaces and Interfaces", *Encyclopedia of Analytical Chemistry*, R.A. Meyers (Ed.), John Wiley & Sons Ltd, Chichester, 2000.
111. Valenzuela Jauregui, J. J., Ramirez Bon, R., Mendoza Galvan, A. and Sotelo Lerma, M. "Optical properties of PbS thin films chemically deposited at different temperatures", *Thin Solid Films*, Vol. 441, Issue 1-2, pp. 104-110, 2003.
112. van der Pauw, L. J. "A method of measuring specific resistivity and Hall effect of discs of arbitrary shape" *Philips Research Reports*, Vol. 13, No. 1, pp. 1-9, 1958.
113. Vayssieres, L. "Aqueous purpose-built nano structured metal oxide thin films", *Int. J. of Material & Product Technology*, Vol. 18, pp. 330-337, 2003.
114. Victor J. Morris, Andrew R. Kirby and Patrick Gunning, A., "Atomic Force Microscopy for biologists" 2<sup>nd</sup> edition Imperial College Press, 2010.
115. Vossen L. J. and Kern W. "Thin film formation", *Phys. Today*, Vol. 33, Issue 5, pp. 26-33, 1980.
116. Wang, Y., Suna, A., Mahler, W. and Kasowski, R., "PbS in polymers. From molecules to bulk solids", *J. Chem. Phys.*, Vol. 87, No. 12, pp. 7315-7322, 1987.
117. Wasa, K., Kitabatake, M. and Adachi, H. "Thin film materials technology: sputtering of compound materials", New York: William Andrew Inc; 2004.

118. Weixin Zhang, Lei Zhang, Youwei Cheng, Zehua Hui, Xiaoming Zhang, Yi Xie and Yitai Qian “Synthesis of nanocrystalline lead chalcogenides PbE (E = S, Se, or Te) from alkaline aqueous solutions”, *Mater. Res. Bull.*, Vol. 35, No. 12, pp. 2009-2015, 2000.
119. Wen-Bo Zhao, Jun-Jie Zhu and Hong-Yuan Chen, “Photochemical preparation of rectangular PbSe and CdSe nanoparticles”, *J. Cryst. Growth*, Vol. 252, No. 4, pp. 587-592, 2003.
120. William D. Callister, Jr. “Materials Science and Engineering An Introduction”, 7<sup>th</sup> edition, New York, John Wiley & Sons, Inc 2007.
121. William Shockley and Hans J. Queisser, “Detailed Balance Limit of Efficiency of p-n Junction Solar Cells”, *J. Appl. Phys.*, Vol. 32, No. 3, pp. 510-519, 1961.
122. Williamson, G. B. and Smallman, R. C. “III. Dislocation densities in some annealed and cold-worked metals from measurements on the X-ray debye-scherrer spectrum”, *Phil. Mag.*, Vol. 1, Iss.1, pp. 34-46, 1956.
123. Williamson, G. K and Hall, W. H, “X-ray line broadening from field aluminium and wolfram”, *Acta Metall.*, Vol. 1, pp. 22-31, 1953.
124. Xiaofeng Qiu, Yixin Zhao, Ian M. Steward, Jeffrey S. Dyck and Clemens Burd “Improvement of the thermoelectric power factor through anisotropic growth of nano structured PbSe thin films, *Dalton Trans.*, Vol. 39, pp. 1095-1100, 2010.
125. Xiaogang Peng, Liberato Manna, Weidong Yang, Juanita Wickham, Erik Scher, Andreas Kadavanich and Alivisatos A. P. “Shape control of CdSe nanocrystals”, *Nature*, Vol. 404, pp. 59-61, 2000.
126. Xinjun Wang, Ke Li, Yutao Dong and Kai Jiang “Preparation and characterization of monodispersed PbSe nanocubes”, *Cryst. Res. Technol.*, Vol. 45, No.1, pp. 94-98, 2010.
127. Yacobi, B. G. “Semiconductor Materials an Introduction to Basic Principles”, Springer publications, First edition, 2003.
128. Yamamoto Osamu, Tadashi Sasamoto and Michio Inagaki “Preparation of crystalline CdSe particles by chemical bath deposition”, *J. Mater. Res.*, Vol. 13, Issue 12, pp. 3394-3398, 1998.

129. Yasuo Ohba, Toru Gotodaa and Kei Kanekoa, "Low current operation of GaN-based blue-violet laser diodes fabricated on sapphire substrate using high-temperature-grown single-crystal AlN buffer layer", *J. Cryst. Growth*, Vol. 298, pp. 682-686, 2007.
130. Yoganarasimhan, S.R. and Rao C.N.R., "Mechanism of crystal structure transformations. Part 3-Factors affecting the anatase-rutile transformation", *Trans. Faraday Soc.*, Vol. 58, pp. 1579-1589, 1962.
131. Yu Jun Yang and Shengshui Hu "The deposition of highly uniform and adhesive nanocrystalline PbS film from solution", *Thin Solid Films*, Vol. 516, Issue 18, pp. 6048-6051, 2008.
132. Zhi Zhao, Jie Zeng, Zejun Ding, Xiaoping Wang, Jianguo Hou and Zengming Zhang, "High pressure photoluminescence of CdZnSe quantum dots: Alloying effect", *J. Appl. Phys.*, Vol. 102, pp. 053509-053511, 2007.
133. Zhijie Wang, Shengchun Qu, Xiangbo Zeng, Changsha Zhang, Mingji Shi, Furui Tan, Zhanguo Wang, Junpeng Liu, Yanbing Hou, Feng Teng and Zhihui Feng, "Synthesis of MDMO-PPV capped PbS quantum dots and their application to solar cells", *Polymer*, Vol. 49, pp. 4647-4651, 2008.