

## REFERENCES

- Achiq, A., Rizk, R., Gourbilleau, F. and Voivenel, P. (1999). Effects of hydrogen partial pressure on the structure and properties of sputtered silicon layers. *Thin Solid Films*. 348. 74-78.
- Ali, A.M. (2007). Origin of Photoluminescence in Nanocrystalline Si:H Films. *J. Luminescence*. 126. 614-622.
- Ali, A.M., Inokuma, T. and Hasegawa, S. (2006). Structural and photo-luminescence properties of nanocrystalline silicon films deposited at low temperature by plasma-enhanced chemical vapor deposition. *Appl. Surf. Sci.* 253. 1198-1204.
- Ali, A.M., Inokuma, T., Kurata, Y. and Hasegawa, S. (2001). Luminescence properties of nanocrystalline silicon films. *Mater. Sci. Eng. C*. 15. 125-128.
- Alivisatos, A.P., Gu, W. and Larabell, C. (2005). Quantum dots as cellular probes. *Ann. Rev. Biomed. Eng.* 7. 55-76.
- Andreja Gajovic, Davor Gracin, Krunoslav Juraic, Jordi Sancho-Parramon and Miran Ceh. (2009). Correlating Raman-spectroscopy and high-resolution transmission-electron-microscopy studies of amorphous/nanocrystalline multilayered silicon thin films. *Thin Solid Films*. 517. 5453-5458.
- Badran, R.I., Al-Hazmi, F.S., Al-Heniti, S., Al-Ghamdi, A.A., Li, J. and Xiong, S. (2009). A study of optical properties of hydrogenated microcrystalline silicon films prepared by plasma enhanced chemical vapor deposition technique at different conditions of excited power and pressure. *Vacuum*. 83. 1023-1030.
- Bakr, N.A., Funde, A.M., Waman, V.S., Kamble, M.M., Hawaldar, R.R., Amalnerkar, D.P., Sathe, V.G., Gosavi, S.W., Jadkar, S.R. (2011). Influence of deposition pressure on structural, optical and electrical properties of nc-Si:H films deposited by HW-CVD. *J. Phys. & Chem. Solids*. 72. 685-691.
- Bayes, B.M., Lewis, N.S. and Atwater, N.A. (2005). Comparison of the device physics principles of planar and radial p-n junction nanorod solar cells. *J. Appl. Phys.* 97. 114302-11.
- Benyoucef, M. and Kuball, M. (2001). Raman scattering and photoluminescence studies on Si/SiO<sub>2</sub> superlattices. *J. Appl. Phys.* 89. 7903-7907.
- Bhattacharya, E. and Mahan, A.H. (1988). Microstructure and the light-induced metastability in hydrogenated amorphous silicon. *Appl. Phys. Lett.* 52 (19). 1587-1589.
- Bhattacharya, K. and Das, D. (2007). Nanocrystalline silicon films prepared from silane plasma in RF-PECVD, using helium dilution without hydrogen: structural and optical characterization. *Nanotechnology*. 18. 415704-9.
- Bhattacharya, K. and Das, D. (2008). Effect of deposition temperature on the growth of nanocrystalline silicon network from helium diluted silane plasma. *J. Phys. D: Appl. Phys.* 41. 155420-8.
- Bi, L., He, Y. and Feng, J.Y. (2006). Effect of post-annealing in oxygen atmosphere on the photoluminescence properties of nc-Si rich SiO<sub>2</sub> films. *J. Cryst. Growth*. 289. 564-567.
- Brodsky, M.H., Cardona, M. and Cuomo, J.J. (1977). Infrared and Raman spectra of the silicon-hydrogen bonds in amorphous silicon prepared by glow discharge and sputtering. *Phys. Rev. B*. 16. 3556-3571.
- Brogliè, L. de. (1923). Wave and Quanta. *Compt. Rend.* 177. 507-510.
- Cabarocas, P.R.I., Layadi, N., Derevillon, B. and Solomon, F. (1996). Microcrystalline silicon growth by the layer-by-layer technique: long term evolution and nucleation mechanisms. *J. Non. Cryst. Solids*. 198-200. 871-874.

- Cabarrocas, Pere Roca I, Morral, Anna Fontcuberta i, Lebib, Sarra and Poissant, Yves. (2002). Plasma production of nanocrystalline silicon particles and polymorphous silicon thin films for large-area electronic devices. *Pure Appl. Chem.* 74(3). 359-367.
- Campbell, I.H. and Fauchet, P.M. (1986). The effects of microcrystal size and shape on the one phonon Raman spectra of crystalline semiconductors. *Solid State Commun.* 58. 739-741.
- Canham, L.T. (1990). Silicon quantum wire array fabrication by electrochemical and chemical dissolution of wafers. *Appl. Phys. Lett.* 57. 1046-1048.
- Cardona, M. (1983). Vibrational Spectra of Hydrogen in Silicon and Germanium. *Phys. Stat. Solidi (b)*. 118. 463-481.
- Cardona, M. and Guntherodt, G. (1982). *Light Scattering in Solids II Topics in Applied Physics*. Vol. 50. Springer. Berlin. Heidelberg. New York. 80.
- Cavalcoli, D., Rossi, M., Cavallini, A. (2011). Defect states in nc-Si:H films investigated by surface photovoltage spectroscopy. *J. Appl. Phys.* 109. 053719-6.
- Cerdeira, F., Buchenauer, C.J., Pollak, F.H. and Cardona, M. (1972). Stress-Induced Shifts of First-Order Raman Frequencies of Diamond- and Zinc-Blende-Type Semiconductors. *Phys. Rev. B*. 5. 580-593.
- Chapman, B. (1980). *Glow Discharge Processes*. John Wiley & Sons. New York.
- Charvet, S., Zeinert, A., Goncalves, C. and Goes, M. (2004). Effect of small nitrogen dilution on the microstructure of hydrogenated silicon thin films deposited by magnetron radiofrequency sputtering. *Thin Solid Films*. 458. 86-91.
- Chen, C., Qiu, S., Liu, C., Wu, Y., Li, P., Yu, C. and Lin, X. (2009). *Plasma Sci. & Technol.* 11(3). 297-301.
- Chen, C.Z., Qiu, S.H., Liu, C.Q., Wu, Y.D., Li, P., Yu, C.Y., Lin, X.Y. (2008). Low temperature fast growth of nanocrystalline silicon films by rf-PECVD from SiH<sub>4</sub>/H<sub>2</sub> gases: microstructural characterization. *J. Phys. D: Appl. Phys.* 41. 195413-6.
- Cheng, Q., Xu, S. and Ostrikov, K. (K). (2009). Rapid, low-temperature synthesis of nc-Si in high-density, non-equilibrium plasmas: enabling nanocrystallinity at very low hydrogen dilution. *J. Mater. Chem.* 19. 5134-5140.
- Cheng, Q., Xu, S. and Ostrikov, K. (K). (2009). Structural evolution of nanocrystalline silicon thin films synthesized in high-density, low-temperature reactive plasmas. *Nanotechnology*. 20. 215606-8.
- Chin, R.P., Shen, Y.R., Koch, V.-P. (1995). Photoluminescence from Porous Silicon by Infrared Multiphoton Excitation. *Science*. 270. 776-778.
- Choi, S.-H., Won, S.H. and Jang, J. (1998). Excitation energy dependence of photoluminescence in nanocrystalline silicon deposited by remote plasma chemical vapor deposition. *Thin Solid Films*. 335. 266-269.
- Chowdhury, A., Mukhopadhyay, S. and Ray, S. (2007). Structural and transport properties of nanocrystalline silicon thin films prepared at 54.24 MHz plasma excitation frequency. *J. Cryst. Growth*. 304. 352-360.
- Chowdhury, A., Mukhopadhyay, S. and Ray, S. (2008). Effect of gas flow rates on PECVD-deposited nanocrystalline silicon thin film and solar cell properties. *Sol. Energy Mater. & Sol. Cells*. 92. 385-392.
- Cody, G.D., Tiedje, T., Abeles, B., Brooks, B. and Goldstein, Y. (1981). Disorder and the Optical-Absorption Edge of Hydrogenated Amorphous Silicon. *Phys. Rev. Lett.* 47. 1480-1483.
- Connibeer, G., Green, M., Cornkish, R., Cho, Y., Cho, E.-C., Jiang, C.-W., Fansuwannarak, T., Pink, E., Huang, Y., Puzzer, T., Trupke, T., Richards, B.,

- Shalav, A. and Lin, K.-I. (2006). Silicon nanostructures for third generation photovoltaic solar cells. *Thin Solid films*. 511-512. 654-662.
- Coscia, U., Ambrosone, G., Lettieri, S., Maddalena, P., Rava, P. and Minarini, C. (2003). Power density effects on the growth of microcrystalline silicon-carbon alloys by PECVD. *Thin Solid Films*. 427. 284-288.
- Cui, Y, Bjork, M.T., Liddle, J.A., Sonnichsen, C., Boussert, B. and Allivisatos, A.P. (2004). Integration of colloidal nanocrystals into lithographically patterned devices. *Nano lett*. 4(6). 1093-1098.
- Cullis, A.G. and Canham, L.T. (1991). Visible light emission due to quantum size effects in highly porous crystalline silicon. *Nature*. 353. 335-338.
- Cullis, A.G., Canham, L.T. and Calcott, P.D.J. (1997). The structural and luminescence properties of porous silicon. *J. Appl. Phys*. 82. 909-57.
- Das, C. and Ray, S. (2002). Power density in RF PECVD: a factor for deposition of amorphous silicon thin films and successive solid phase crystallization. *J. Phys. D: Appl. Phys*. 35. 2211-2216.
- Das, C., Jana, T. and Ray, S. (2004). Optoelectronic and Structural Properties of Undoped Microcrystalline Silicon Thin Films: Dependence on Substrate Temperature in Very High Frequency Plasma Enhanced Chemical Vapor Deposition Technique. *Jpn. J. Appl. Phys*. 43. 3269-3274.
- Das, D. (1995). Control of hydrogenation and modulation of the structural network in Si:H by interrupted growth and H-plasma treatment. *Phys. Rev. B*. 51(16). 10729-10736.
- Das, D. (2005). Structural studies on Si:H network by Raman, micro-photoluminescence, electron microscopy and ultraviolet ellipsometry: effect of Ar dilution to the SiH<sub>4</sub>-plasma. *Thin Solid Films*. 476. 237-245.
- Davies, E.A., Piggins, N. and Bayliss, S.C. (1987). Optical properties of amorphous SiN<sub>x</sub>(:H) films. *J. Phys. C: Solid State Physics*. 20. 4415-4427.
- Dinh, L.N., Chase, L.L., Balooch, M., Siekhaus and W.J., Wooten, F. (1996). Optical properties of passivated Si nanocrystals and SiO<sub>x</sub> nanostructures. *Phys. Rev. B* 54. 5029-5037.
- Du, W., Yang, X., Povolny, H., Liao, X. and Deng, X. (2005). Impact of hydrogen dilution on microstructure and optoelectronic properties of silicon films deposited using trisilane. *J. Phys. D: Appl. Phys*. 38. 838-842.
- Ehbrecht, M., Kohn, B. and Huisken, F. (1997). Photoluminescence and resonant Raman spectra of silicon films produced by size-selected cluster beam deposition. *Phys. Rev. B* 56(11). 6958-6964.
- Everhart, T.E. and Thornley, R.F.M. (1960). Wide-Band Detector for Micro-Micro-ampere Low Energy Electron Currents. *J. Sci. Instrum*. 37. 246-248.
- Fang, P.H., Schubert, C.C., Bei, P., and Kinnier, J.H. (1982). Combined microcrystal and amorphous silicon cells. *Appl. Phys. Lett*. 41(4). 365-366.
- Fauchet, P.M. (1996). Photoluminescence and electroluminescence from porous silicon. *J. Lumin*. 70. 294-309.
- Feenstra, K.F., Werf, C.H.M. van der, Molenbroek, E.C. and Schropp, R.E.I. (1997). Deposition of device quality amorphous silicon by hot-wire CVD. *Mater. Res. Soc. Symp. Proc*. 467. 645-650.
- Feitknecht, L., Kluth, O., Ziegler, Y., Niquille, X., Torres, P., Meier, J, Wyrsh, N. and Shah, A. (2001). Microcrystalline n-i-p solar cells deposited at 10 Å/s by VHF-GD. *Sol. Energy Mater. & Sol. Cells*. 66. 397-403.
- Fejfar, A., Beck, N., Stuchlikova, H., Wyrsh, N., Torres, P., Meier, J., Shah, A. and Kocka, J. (1998). On the transport properties of microcrystalline silicon. *J. Non-Cryst. Solids*. 227-230. 1006.

- Ficcadenti, M., Pinto, N., Morresi, L., Murri, R., Serenelli, L., Tucci, M., Falconieri, M., Krasilnikova, A., Grilli, M.L., Mittiga, A., Izzi, M., Pirozzi, L. and Jadkar, S.R. (2009). Si quantum dots for solar cell fabrication. *Mat. Sci & Eng. B.* 159-160. 66-69.
- Fujiwara, H., Kondo, M. and Matsuda, A. (2001). Real-time spectroscopic ellipsometry studies of the nucleation and grain growth processes in microcrystalline silicon thin films. *Phys. Rev. B.* 63. 115306-9.
- Fujiwara, H., Kondo, M. and Matsuda, A. (2002). Microcrystalline silicon nucleation sites in the sub-surface of hydrogenated amorphous silicon. *Surf. Sci.* 497. 333-340.
- Fukawa, M., Suzuki, S., Guo, L., Kondo, M. and Matsuda, A. (2001). High rate growth of microcrystalline silicon using a high-pressure depletion method with VHF plasma. *Sol. Energy Mater. & Sol. Cells.* 66. 217-223.
- Furukawa, S. and Miyasato, T. (1988). Quantum size effects on the optical band gap of microcrystalline Si:H. *Phys. Rev. B* 38(8). 5726-5729.
- Ganguly, G. and Matsuda, A. (1993). Defect formation during growth of hydrogenated amorphous silicon. *Phys. Rev. B.* 47. 3661-3670.
- Goerlitzer, M., Torres, P., Beck, N., Wyrsh, N., Keppner, H., Pohl, J. and Shah, A. (1998). Structural properties and electronic transport in intrinsic microcrystalline silicon deposited by the VHF-GD technique. *J. Non-Cryst. Solids.* 227-230. 996-1000.
- Goh Boon Tong and Saadah A. Rahman. (2007). Infrared and Raman Spectroscopy Studies on Pulsed PECVD a-Si:H Films. *Solid State Sci. & Technol.* 15 (2). 153 - 160.
- Goh Boon Tong and Saadah Abdul Rahman. (2004). Effects of Silane Flow-Rate on the Structural Properties of a-Si:H Thin Films Deposited by D.C. and Pulsed PECVD Technique. *Solid State Sci. & Technol.* 12 (1). 47-52.
- Goh Boon Tong, Shi Chee Han, Richard Ritikos, Muhamad Rasat Muhamad and Saadah A. Rahman. (2006). Photoconductivity in pulsed PECVD hydrogenated amorphous silicon thin films. *Jurnal Fizik Malaysia.* 27 (3). 121-124.
- Goh Boon Tong, Ti Shi Heng, Joshua Pang Wui Lian, Jong Tze Kian and Saadah A. Rahman. (2002). Optical and Chemical Bonding Properties of Hydrogenated Amorphous Silicon. *J. Fizik Malaysia.* 23 (1-4). 103-106.
- Goh Boon Tong. (2005). Hydrogenated amorphous silicon by pulsed plasma enhanced chemical vapour deposition technique. MSc Thesis. University of Malaya.
- Goodhew, P.J. and Humphreys, F.J. (1988). *Electron Microscopy and Analysis.* Second Edition. Taylor & Francis. NY.
- Gotoh., T., Nonomura, S., Nishio, M. Nitta, S., Kondo, M. and Matsuda, A. (1998). 1.3  $\mu\text{m}$  photoresponsivity in Si-based Ge<sub>1-x</sub>C<sub>x</sub> photodiodes. *Appl. Phys. Lett.* 72. 1860-3.
- Gudovskikh, A.S., Kleider, J.P., Afanasjev, V.P., Kazak-Kazakevich, A.Z. and Sazanov, A.P. (2004). Investigation of nc-Si inclusions in multilayer a-Si:H films obtained using the layer by layer technique. *J. Non-Cryst. Solids.* 338-340. 135-138.
- Guha, S., Yang, J., Williamson, D.L., Lubianiker, Y., Cohen, J.A. and Mahan, A.H. (1999). Structural, defect, and device behavior of hydrogenated amorphous Si near and above the onset of microcrystallinity. *Appl. Phys. Lett.* 74. 1860-3.
- Guha, S., Yang, J., Williamson, D.L., Lubianiker, Y., Cohen, J.D. and Mahan, A.H. (1999). Experimental evidence of photoinduced expansion in hydrogenated amorphous silicon using bending detected optical lever method. *Appl. Phys. Lett.* 72. 2978-3.

- Gullanar, M.H., Zhang, Y.H., Chen, H., Wei, W.S., Xu, G.Y., Wang, T.M., Cui, R.Q. and Shen, W.Z. (2003). Effect of phosphorus doping on the structural properties in nc-Si:H thin films. *J. Cryst. Growth*. 256 (3-4). 254-260.
- Guo, L., Kondo, M., Fukawa, M., Saitoh, K. and Matsuda, A. (1998). High Rate Deposition of Microcrystalline Silicon Using Conventional Plasma-Enhanced Chemical Vapor Deposition. *Jpn. J. Appl. Phys.* 37. L1116-L1118.
- Guo, L.Q., Ding, J.N., Yang, J.C., Cheng, G.G., Ling, Z.Y., Yuan, N.Y. (2011). Effects of hydrogen dilution ratio on optical properties of hydrogenated nanocrystalline silicon thin films. *Appl. Surf. Sci.* 257. 9840-9845.
- Guo, X., Zhang, S., Bao, Z., Zhang, H., Chen, C., Liu, L., Liu, Y., Xie, E. (2011). Effect of Substrate Temperature on the Structural, Electrical and Optical Properties of Nanocrystalline Silicon Films in Hot-Filament Chemical Vapor Deposition. *CHIN. PHYS. LETT.* 28 (2). 028103-4.
- Hadjadj, A., Beorchia, A., Cabarocas, P. Roca i, Boufendi, L., Huet, S. and Bubendorff, J.L. (2001). Effects of the substrate temperature on the growth and properties of hydrogenated nanostructured silicon thin films. *J. Phys. D: Appl. Phys.* 34. 690-699.
- Halindintwali, S. (2005). A Study of Hydrogenated Nanocrystalline Silicon Thin Films Deposited by Hot-Wire Chemical Vapour Deposition (HWCVD). PhD Thesis. Dept. of Phys., Univ. of the Western Cape.
- Hamma, S. and Cabarocas, P.R.I. (1998). Low temperature growth of highly crystallized silicon thin films using hydrogen and argon dilution. *J. Non. Cryst. Solids*. 227-230. 852-856.
- Han, D. and Wang, K. (2003). Photo- and electro-luminescence of a-Si:H and mixed-phase alloys. *Sol. Energy Mat. & Sol. Cells*. 78. 181-233.
- Hattori, Y., Kruangam, D., Katoh, K., Nitta, Y., Okamoto, H. and Hamakawa, Y. (1987). High-Conductivity Wide Band Gap P-Type a-SiC:H Prepared by ECR-CVD and Its Application to High Efficiency a-Si Basic Solar Cells. *Proc. of the 19th IEEE PV Specialists Conf.* 689-694.
- Hindley, N.K. (1970). Random phase model of amorphous semiconductors I. Transport and optical properties. *J. Non-Cryst. Solids* 5. 17-30.
- Houben, L., Luysberg, M., Hapke, P., Vetterl, O., Finger, F., Carius, R. and Wagner, H.J. (1998). Morphological and crystallographic defect properties of microcrystalline silicon: a comparison between different growth modes. *J. Non. Cryst. Solids*. 227-230. 896-900.
- Iacona, F., Franzo, G. and Spinella, C. (2000). Correlation between luminescence and structural properties of Si nanocrystals. *J. Appl. Phys.* 87. 1295-1303.
- Ichikawa, Y.K., Aizawa, Shimabukuro, H., Nagao, Y. and Sakai, H. (1987). Deposition Process and Film Properties of a-Si alloy Films. *Technical Digest of the International PVSEC-3*. Tokyo. Japan. A-1p-5.
- Iqbal, Z. and Veprek, S. (1982). Raman scattering from hydrogenated microcrystalline and amorphous silicon. *J. Phys. C*. 15(2). 377-392.
- Itabashi, N., Nishiwaki, N., Magane, M., Goto, T., Matsuda, A., Yamada, C. and Hirota, E. (1990a). SiH<sub>3</sub> Radical Density in Pulsed Silane Plasma. *Jpn. J. Appl. Phys.* 29. 585-590.
- Itabashi, N., Nishiwaki, N., Magane, M., Saito, S., Goto, T., Matsuda, A., Yamada, C. and Hirota, E. (1990b). Spatial Distribution of SiH<sub>3</sub> Radicals in RF Silane Plasma. *Jpn. J. Appl. Phys.* 29. L505-L507.
- Jadkar, S.R., Sali, J.V., Funde, A.M., Bakr, N.A., Vidyasagar, P.B., Hawaldar, R.R. and Amalnerkar, D.P. (2007). Deposition of hydrogenated amorphous silicon (a-Si:H) films by hot-wire chemical vapor deposition (HW-CVD) method: Role of substrate temperature. *Sol. Energy Mater. & Sol. Cells*. 91. 714-720.

- Jadkar, S.R., Sali, J.V., Musale, D.V., Kshirsagar, S.T. and Takwale, M.G. (2002). Influence of silane flow on structural, optical and electrical properties of a-Si:H thin films deposited by hot wire chemical vapor deposition (HW-CVD) technique. *Sol. Energy Mater. & Sol. Cells*. 71. 153–167.
- Jadkar, S.R., Sali, J.V., Takwale, M.G., Musale, D.V. and Kshirsagar, S.T. (2000). Synthesis of highly conductive boron-doped p-type hydrogenated microcrystalline silicon ( $\mu\text{c-Si:H}$ ) by a hot-wire chemical vapour deposition (HWCVD) technique. *Sol. Energy Mater. & Sol. Cells*. 64. 333-346.
- Jansen, F., Mort, J. and Morgan, M. (1985). Nature and Distribution of Radicals in RF and DC Silane Discharge; Effects on Deposition Rate and Physical Properties of a-Si:H. *Canadian J. Chem.* 63. 217-220.
- Jeon, K.A., Kim, J.H., Kim, G.H. and Lee, S.Y. (2005). Oxidation effects on the photoluminescent properties of Si nanocrystalline thin films. *Opt. Mater.* 27. 988-990.
- Jorke, H., Herzog, J. and Kibbel, H. (1989). Kinetics of ordered growth of Si on Si(100) at low temperatures. *Phys. Rev. B*. 40. 2005-2008.
- Kamei, T., Fukawa, M., Nishimiya, T., Isomura, M., Kondo, M., Matsuda, A., Clafin, B. and Lucovsky, G. (1998). How do Impurities Affect the Growth of  $\mu\text{c-Si:H}$ ? *Proc. Mater. Res. Soc. Symp.* 507. 867-878.
- Kamiya, T., Nakahata, K., Ro, K., Fortman, C.M. and Shimizu, I. (1999). Comparison of Microstructure and Crystal Structure of Polycrystalline Silicon Exhibiting Varied Textures Fabricated by Microwave and Very High Frequency Plasma Enhanced Chemical Vapor Deposition and Their Transport Properties. *Jpn. J. Appl. Phys.* 38. 5750-5756.
- Kanemitsu, Y. (1995). Light emission from porous silicon and related materials. *Phys. Rep.* 263. 1-91.
- Kanemitsu, Y. and Okamoto, S. (1997). Resonantly excited photoluminescence from porous silicon: Effects of surface oxidation on resonant luminescence spectra. *Phys. Rev. B*. 56. R1696-R1699.
- Kanemitsu, Y., Okamoto, S., Otobe, M. and Oda, S. (1997). Photoluminescence mechanism in surface-oxidized silicon nanocrystals. *Phys. Rev. B*. 55. R7375-R7378.
- Kanemitsu, Y., Uto, H., Masumoto, Y., Matsumoto, T. and Mimura, H. (1993). Microstructure and optical properties of free-standing porous silicon films: Size dependence of absorption spectra in Si nanometer-sized crystallites. *Phys. Rev. B*. 48. 2827-2830.
- Karim, K.S. (2002). Pixel Architectures for Digital Imaging Using Amorphous Silicon Technology. PhD thesis. University of Waterloo. Waterloo.
- Kasper, W., Bohm, H. and Hirschauer, B. (1992). The influence of electrode areas on radio-frequency glow-discharge. *J. Appl. Phys.* 71. 4168-4172.
- Kern, W. (1993). *Handbook of Semiconductor Cleaning Technology*. Noyes Publishing. Park Ridge. NJ.
- Kern, W. and Vossen, J. (1978). *Thin Film Processes*. New York. Academic Press.
- Kim, S.K., Park, K.C. and Jang, J. (1995). Effect of  $\text{H}_2$  dilution on the growth of low temperature as - deposited poly - Si films using  $\text{SiF}_4/\text{SiH}_4/\text{H}_2$  plasma. *J. Appl. Phys.* 77. 5115.
- Kim, T.Y., Park, N.M., Kim, K.H., Sung, G.Y., Ok, Y.W., Seong, T.Y. and Choi, C.-J. (2004). Quantum confinement effect of silicon nanocrystals in situ grown in silicon nitride films. *Appl. Phys. Lett.* 85. 5355-5357.
- Kiriluk, K.G., Williamson, D.L., Taylor, P.C., Yan, B., Yue, G., Yang, J. Guha, S. (2011). An X-ray scattering study of hydrogenated nanocrystalline silicon with varying crystalline silicon. *J. Non-Cryst. Solids*. 357. 2587-2589.

- Kitagawa, T., Kondo, M. and Matsuda, A. (2000). Hydrogen-mediated low-temperature epitaxy of Si in plasma-enhanced chemical vapor deposition. *Appl. Surf. Sci.* 159-160. 30-34.
- Kleider, J.P., Longeaud, C., Gauthier, M., Meaudre, M., Meaudre, R., Butte, R., Vignoli, S. and Cabarrocas, P. Roca i. (1999). Very low densities of localized states at the Fermi level in hydrogenated polymorphous silicon from capacitance and space-charge-limited current measurements. *Appl. Phys. Lett.* 75. 3351-3.
- Klein, J.D., Yen, A. and Cogan, F. (1990). Determining thin film properties by fitting optical transmittance. *J. Appl. Phys.* 68. 1825-6.
- Klug H.P. and Alexander L.E. (1985). *X-ray Diffraction Procedures for Polycrystalline and Amorphous Materials.* John Wiley and Sons Inc. New York.
- Kniffer, N., Schroder, B. and Geiger, J. (1983). Vibrational spectroscopy of hydrogenated evaporated amorphous silicon films. *J. Non-Cryst. Solids.* 58. 153-163.
- Knights, J.C., Lujan, R.A., Rosenblum, M.P., Street, R.A., Biegleson, D.K. and Reimer, J.A. (1981). Effects of inert gas dilution of silane on plasma - deposited a - Si:H films. *Appl. Phys. Lett.* 38. 331-3.
- Koch, F., Petrova-Koch, V., Muschik, T., Nikolov, A. and Gavrilenko, V. (1992). Some Perspectives on the Luminescence Mechanism Via Surface-Confined States of Porous Si. *Mater. Res. Soc. Symp. Proc.* 283. 197-202.
- Kondo, M., Fukawa, M., Guo, L. and Matsuda, A. (2000). High rate growth of microcrystalline silicon at low temperatures. *J. Non-Cryst. Solids.* 266-269. 84-89.
- Kondo, M., Fukawa, M., Guo, L. and Matsuda, A. (2000). High rate growth of microcrystalline silicon at low temperatures. *J. Non-Cryst. Solids.* 266-269. 184-89.
- Kondo, M., Ohe, T., Saito, K., Nishimiya, T. and Matsuda, A. (1998). Morphological study of kinetic roughening on amorphous and microcrystalline silicon surface. *J. Non-Cryst. Solids.* 227. 890-895.
- Kondo, M., Toyoshima, Y., Ikuta, K. and Matsuda, A. (1996). Erratum: "Effective ionization and dissociation rate coefficients of molecular hydrogen in plasma" [*J. Appl. Phys.* 78, 2913 (1995)]. *J. Appl. Phys.* 80. 606-1.
- Kono, A., Koike, N., Nomura, H. and Goto, T. (1995). Laser-Induced-Fluorescence Study of the SiH<sub>2</sub> Density in RF SiH<sub>4</sub> Plasmas with Xe, Ar, He, and H<sub>2</sub> Dilution Gases. *Jpn. J. Appl. Phys.* 34. 307-311.
- Konuma, M., Curtins, H., Sarott, F.A. and Veprek, S. (1987) Dependence of electrical conductivity of nanocrystalline silicon on structural properties and the effect of substrate bias. *Phil. Mag. B.* 55. 377-389.
- Kumar, S., Dixit, P.N., Rauthan, C.M.S., Parashar, A. and Gope, J. (2008). Effect of power on the growth of nanocrystalline silicon films. *J. Phys.: Condens. Matter.* 20. 335215-7.
- Laidler, K.J. and Meiser, J.H. (1995). *Physical Chemistry.* second edition.
- Langford, A.A., Fleet, M.L., Nelson, B.P., Lanford, W.A. and Maley, N. (1992). Infrared absorption strength and hydrogen content of hydrogenated amorphous silicon. *Phys. Rev. B.* 45. 13367-13377.
- Lebib, S. and Cabarrocas, P. Roca i. (2005). Effects of ion energy on the crystal size and hydrogen bonding in plasma-deposited nanocrystalline silicon thin films. *J. Appl. Phys.* 97. 104334-10.
- Ledoux, G., Guillois, O., Porterat, D., Reynaud, C., Huisken, F., Kohn, B. and Paillard, V. (2000). Photoluminescence properties of silicon nanocrystals as a function of their size. *Phys. Rev. B.* 62. 15942-15951.

- Lee, S.M. and Singh, Rajiv. K. (1999). Lateral Solid Phase Crystallization of Amorphous Silicon Under High Pressure. *Mat. Res. Soc. Symp. Proc.* 557. 219-224.
- Lehmann, V. and Foll, H. (1990). Formation Mechanism and Properties of Electrochemically Etched Trenches in n-Type Silicon. *J. Electrochem. Soc.* 137. 653-659.
- Li, W., Xia, D.L., Wang, H.F., Zhao, X.J. (2010). Hydrogenated nanocrystalline silicon thin film prepared by RF-PECVD at high pressure. *J. Non-Cryst. Solids.* 356. 2552-2556.
- Lieberman, Michael A. and Lichtenberg, Allan J. (1994). *Principles of Plasma Discharges and Materials Processing.* John Wiley & Sons. New York.
- Lim Seck Chai, Goh Boon Tong and Saadah Abdul Rahman. (2004). Effects of Annealing on the Electro-Optical Properties of a-Si:H Thin Films Deposited by D.C. and Pulsed PECVD Technique. *Solid State Sci. & Technol.* 12 (1). 59-64.
- Lim, H.J., Ryu, B.Y., Ryu, J.I. and Jang, J. (1996). Structural and electrical properties of low temperature polycrystalline silicon deposited using  $\text{SiF}_4$ --- $\text{SiH}_4$ --- $\text{H}_2$ . *Thin Solid Films.* 289. 227-233.
- Lin, C.-Y., Fang, Y.-K., Chou, T.-H., Hwang, J.S. and Lin, K.I. (2006). Growth of nanocrystalline silicon thin film with layer-by-layer technique for fast photo-detecting applications. *Mat. Sci & Eng. B.* 127. 251-254.
- Lin, X. Y., Huang, C. J., Lin, K. X., Yu, Y. P., Yu, C. Y. and Chi, L. F. (2003). Low-Temperature Growth of Polycrystalline silicon Films by  $\text{SiCl}_4/\text{H}_2$  rf Plasma Enhanced Chemical Vapour Deposition. *Chin. Phys. Lett.* 20. 1879-1882.
- Linnros, J., Lalie, N., Galecka, A. and Grivickas, V. (1999). Analysis of the stretched exponential photoluminescence decay from nanometer-sized silicon crystals in  $\text{SiO}_2$ . *J. App. Phys.* 86. 6128-6135.
- Liu, M., He, Y. and Jiang, X. (1998). Photoluminescence characteristics of oxidized hydrogenated nanocrystalline silicon film. *NanoStructured Mater.* 10. 257-265.
- Liu, X., Wu, X., Bao, X. and He, Y. (1994). Photoluminescence from nanocrystallites embedded in hydrogenated amorphous silicon films prepared by plasma enhanced chemical vapor deposition. *Appl. Phys. Lett.* 64. 220-3.
- Llewellyn-Jones, F. (1966). *The glow discharge and Introduction to Plasma Physics.* Methuen & Co. Ltd.
- Lorenzo Pavvesi and Rasit Turan. (2010). *Silicon Nanocrystals: Fundamentals, Synthesis and Applications.* Wiley-VCH. Weinheim.
- Lucovsky, G., Nemanich, R.J. and Knights, J.C. (1979). Structural interpretation of the vibrational spectra of a-Si: H alloys. *Phys. Rev. B.* 19. 2064-2073.
- Lucovsky, G. and Pollard, W.B. (1984). *The Physics of Hydrogenated Amorphous Silicon II.* Edited by Joannopoulos, J.D. and Lucovsky, G. Springer-Verlag. New York.
- Lucovsky, G., Yang, J., Chao, S.S., Tyler, J.E. and Czubytyj, W. (1983). Oxygen-bonding environments in glow-discharge-deposited amorphous silicon-hydrogen alloy films. *Phys. Rev. B.* 28(6). 3225-3233.
- Luo, P.Q., Zhou, Z.B., Chan, K.Y., Tang, D.Y., Cui, R.Q. and Dou, X.M. (2008). Gas doping ratio effects on p-type hydrogenated nanocrystalline silicon thin films grown by hot-wire chemical vapour deposition. 255. 2910-2915.
- Mahan, A.H., Yang, J., Guha. S. and Williamson, D.L. (2000). Structural changes in a-Si:H film crystallinity with high H dilution. *Phys. Rev. B.* 61(3). 1677-1680.
- Mahan, H. (2001). Status of Cat-CVD (Hot Wire CVD) research in the United States. *Thin Solid Films.* 395. 12.



- Manfredotti, C., Fizzotti, F., Beoro, M., Pastorino, P., Polesello, P. and Vittone, E. (1994). Influence of hydrogen-bonding configurations on the physical properties of hydrogenated amorphous silicon. *Phys. Rev. B.* 50. 18046-18053.
- Manificier, J., Gasiot, J. and Fillard, J.P. (1976). A simple method for the determination of the optical constants  $n$ ,  $k$  and the thickness of a weakly absorbing thin film. *J. Phys. E: Sci. Instr.* 9. 1002-1004.
- Marinov M. and Zotov N. (1997). Model investigation of the Raman spectra of amorphous silicon. *Phys. Rev. B* 55. 2938-2944.
- Masson, D., Sacher, E. and Yelon, A. (1987). Evolution of the vibration spectra of hydrogenated-amorphous-silicon thin films having columnar morphology. *Phys. Rev. B.* 35 (3). 1260-1266.
- Matsuda, A. (1983). Formation kinetics and control of microcrystallite in  $\mu\text{-Si:H}$  from glow discharge plasma. *J. Non-Cryst. Solids.* 59 & 60. 767-774.
- Matsuda, A. (1999). Growth Mechanism of Microcrystalline Silicon Obtained From Reactive Plasmas. *Thin Solid Films.* 337. 1-6.
- Matsuda, A. (2004). Microcrystalline silicon. Growth and Device Application. *J. Non-Cryst. Solids.* 338-340. 1-12.
- Matsuda, A. and Tanaka, K. (1982). Plasma spectroscopy—Glow discharge deposition of hydrogenated amorphous silicon. *Thin Solid Films* 92. 171-187.
- Matsuda, A. and Tanaka, K. (1987). Guiding principle for preparing highly photosensitive Si-based amorphous alloys. *J. Non-Cryst. Solids.* 97 & 98. 1367-1374.
- Matsuda, A., Kumagai, K. and Tanaka, K. (1983). Wide-Range Control of Crystallite Size and Its Orientation in Glow-Discharge Deposited  $\mu\text{-Si:H}$ . *Jpn. J. Appl. Phys.* 22. L34-L36.
- Matsuda, A., Nakagawa, K., Tanaka, K., Matsumura, M., Yamasaki, S., Okushi, H. and Iizima, S. (1980). Plasma spectroscopy control and analysis of a-Si:H deposition. *J. Non-Cryst. Solids.* 35 & 36. 183-188.
- Matsuda, A., Takai, M., Nishimoto, T. and Kondo, M. (2003). Control of plasma chemistry for preparing highly stabilized amorphous silicon at high growth rate. *Sol. Energy Mater. & Sol. Cells.* 78. 3-26.
- Matsumi, Y., Hayashi, T., Yoshikawa, H. and Komiya, S. (1986). Laser diagnostics of a silane plasma—SiH radicals in an a - Si:H chemical vapor deposition system. *J. Vac. Sci. Tech.* A4. 1786-5.
- Matsumura, H. (1998). Formation of Silicon-Based Thin Films Prepared by Catalytic Chemical Vapor Deposition (Cat-CVD) Method. *Jpn. J. Appl. Phys.* 37. 3175-3187.
- Mayandi, J., Finstad, T.G., Thogersen, A., Foss, S., Serincan, U. and Turan, R. (2007). Scanning probe measurements on luminescent Si nanoclusters in SiO<sub>2</sub> films. *Thin Solid Films.* 515. 6375-6380.
- Millerova, J., Prusakova, L., Netrvalova, M., Vavrunkova, V. and Sutta, P. (2010). A study of optical absorption in amorphous hydrogenated silicon thin films of varied thickness. *Appl. Surf. Sci.* 256. 5667-5671.
- Milovzorov, D., Inokuma, T., Kurata, Y. and Hasegawa, S. (1998). Relationship Between Structural and Optical Properties in Polycrystalline Silicon Films Prepared at Low Temperature by Plasma-Enhanced Chemical Vapor Deposition. *J. Electrochem. Soc.* 145. 3615-3620.
- Miura, S., Nakamura, T., Fujii, M., Inui, M. and Hayashi, S. (2006). Size dependence of photoluminescence quantum efficiency of Si nanocrystals. *Phys. Rev. B.* 73. 245333-5.

- Modreanu, M., Aperathitis, E., Androulidaki, M., Audier, M. and Pluchery, O.-C. (2005). Characterisation of room temperature blue emitting Si/SiO<sub>2</sub> multilayers. *Opt. Mater.* 27. 1020-1025.
- Morigaki, K. (1999). *Physics of Amorphous Semiconductors*. Imperial College Press. London.
- Mott, N.F. and Davies, E.A. (1979). *Electronic Processes in Non-Crystalline Materials*. Clarendon. Oxford.
- Moustakas, T.D., Maruska, H. Paul and Friedman, R. (1985). Properties and photovoltaic applications of microcrystalline silicon films prepared by rf reactive sputtering. *J. Appl. Phys.* 58(2). 983-986.
- Mukhopadhyay, S., Chandra Saha, S. and Ray, S. (2001). Role of Substrate Temperature on the Properties of Microcrystalline Silicon Thin Films. *Jpn. J. Appl. Phys.* 40. 6284-6289.
- Mukhopadhyay, S., Chowdhury, A. and Ray, S. (2006). Substrate temperature dependence of microcrystalline silicon growth by PECVD technique. *J. Non-Cryst. Solids.* 352. 1045-1048.
- Mukhopadhyay, S., Das, C. and Ray, S. (2004). Structural analysis of undoped microcrystalline silicon thin films deposited by PECVD technique. *J. Phys. D: Appl. Phys.* 37. 1736-1741.
- Mullerova, J., Jurecka, S. and Sutta, P. (2006). Optical characterization of polysilicon thin films for solar applications. *Sol. Energy.* 80. 667-674.
- Nagata, Y., Kunioka, A. and Yamazaki, S. (1981). Microcrystalline structure in glow-discharge-produced silicon films. *Appl. Phys. Lett.* 38(3). 142-143.
- Nakamura, A. and Tanaka, K. (1987). Guiding principle for preparing highly photosensitive Si-based amorphous alloys. *J. Non-Cryst. Solids.* 97 & 98. 1367-1374.
- Nakamura, K., Yoshida, K., Takeoka, S. and Shimizu, I. (1995). Roles of Atomic Hydrogen in Chemical Annealing. *Jpn. J. Appl. Phys.* 34. 442-449.
- Nozaki, Y., Kitazoe, M., Horii, K., Umemoto, H., Masuda, A. and Matsumura, H. (2001). Identification and gas phase kinetics of radical species in Cat-CVD processes of SiH<sub>4</sub>. *Thin Solid Films.* 395. 47-50.
- Oda, S. and Odobe, M. (1995). Preparation of Nanocrystalline Silicon by Pulsed Plasma Processing. *Mater. Res. Soc. Symp. Proc.* 358. 721-732.
- Ogut, S., Chelikowsky, J.R. and Louie, S.G. (1997). Quantum Confinement and Optical Gaps in Si Nanocrystals. *Phys. Rev. Lett.* 79. 1770-1773.
- Oilic, C., Mur, P., Blanquet, E., Delapierre, G., Vinet, F. and Billon, T. (2007). DNA microarrays on silicon nanostructures: Optimization of the multilayer stack for fluorescence detection. *Biosensors and Bioelectronics.* 22. 2086-2092.
- Orpella, A., Voz, C., Puigdollers, J., Dosev, D., Fonorodona, M., Soler, D., Bertomeu, J., Asensi, J.M., Andreu, J. and Alcubilla, R. (2001). Stability of hydrogenated nanocrystalline silicon thin-film transistors. *Thin Solid Films.* 395. 335-338.
- Parashar, A., Kumar, S., Gope, J., Rauthan, C.M.S., Dixit, P.N. and Hashmi, S.A. (2010). Influence of argon dilution on growth and properties of hydrogenated nanocrystalline silicon films. *Sol. Energy Mater. & Sol. Cells.* 94. 892-899.
- Pei, Z. and Hwang, H.L. (2003). Formation of silicon nano-dots in luminescent silicon nitride. *App. Surf. Sci.* 212-213. 760-764.
- Perrin, J., Leroy, O. and Bordage, M.C. (1996). Cross-Sections, Rate Constants and Transport Coefficients in Silane Plasma Chemistry. *Contrib. Plasma Phys.* 36. 3-49.
- Photopoulos, P., Nassiopoulpu, A.G., Kouvatsos, D.N. and Travlos, A. (2000). Photo- and electroluminescence from nanocrystalline silicon single and multilayer structures. *Mater. Sci. & Eng. B.* 69-70. 345-349.

- Pollard, W.B., Lucovsky, G. and Nemanich, R.J. (1982). Phonons in polysilane alloys. *Phys. Rev. B*. 26. 3172-3180.
- Qi, W.H. and Lee, S.T. (2009). Core-shell structures of silicon nanoparticles and nanowires with free and hydrogenated surface. *Chem. Phys. Lett.* 483(4-6). 247-249.
- Qin, G.G., Li, A.P., Zhang, B.R. and Li, B.C. (1995). Visible electroluminescence from semitransparent Au film/extra thin Si - rich silicon oxide film/p - Si structure. *J. Appl. Phys.* 78(3). 2006-2009.
- Ray, S., Mukhopadhyay, S., Jana, T. and Carius, R. (2002). Transition from amorphous to microcrystalline Si:H: effects of substrate temperature and hydrogen dilution. *J. Non-Cryst. Solids*. 299-302. 761-766.
- Remolina, A., Monroy, B.M., Garcia-Sanchez, M.F., Ponce, A., Bizarro, M., Alonso, J.C., Ortiz, A. and Santana, G. (2009). Polymorphous silicon thin films obtained by plasma-enhanced chemical vapour deposition using dichlorosilane as silicon precursor. *Nanotechnology*. 20. 245604-6.
- Richter, H. and Ley, L. (1981). Optical properties and transport in microcrystalline silicon prepared at temperatures below 400°C. *J. Appl. Phys.* 52(12). 7281-7286.
- Richter, H., Wang, Z.P. and Ley, L. (1981). The one phonon Raman spectrum in microcrystalline silicon. *Solid State Commun.* 39. 625-629.
- Ruther, R. and Livingstone, J. (1994). Hydrogenated amorphous silicon: Hydrogen content, bonding configurations and morphology in sputter-deposited in chamber annealed thin films. *Thin Solid Films*. 251. 30-35.
- Saadah Abdul Rahman. (2001). Preparation and characterization of hydrogenated amorphous silicon/silicon nitride superlattice. RMK7 IRPA Seminar, University of Malaya. p.810-814 & 815-818.
- Saito, K., Kondo, M., Furukawa, M., Nishimiya, T., Futako, W., Shimizu, I. and Matsuda, A. (1998). Role of Hydrogen for Microcrystalline Silicon Formation. *Mater. Res. Soc. Proc.* 507. 843-846.
- Sato, K. and Hirakuri, K. (2005). Improved luminescence intensity and stability of nanocrystalline silicon due to the passivation of nonluminescent states. *J. Appl. Phys.* 97. 104326-5.
- Sato, K. and Hirakuri, K. (2006). Improved luminescence properties of nanocrystalline silicon based electroluminescent device by annealing. *Thin Solid Films*. 515. 778-781.
- Scheib, M., Schroeder, B. and Oechsner, H. (1996). Deposition of nanocrystalline silicon films (nc-Si:H) from a pure ECWR-SiH<sub>4</sub> plasma. *J. Non-Cryst. Solids*. 198-200. 895-898.
- Schroder, B., Weber, U., Seitz, H., Ledermann, A. and Mukherjee, C. (2001). Current status of the thermo-catalytic (hot-wire) CVD of thin silicon films for photovoltaic applications. *Thin Solid Films*. 395. 298-304.
- Schroder, D.K. (1998). *Semiconductor Material and Device Characterization*. 2nd Edition. John Wiley & Sons. New York.
- Schropp, R.E.I. and Zeman, M. (1998). *Amorphous and Microcrystalline Silicon Solar Cells: Modeling, Materials and Device Technology*. Kluwer Academic Pub. Boston.
- Searle, T. (1998). *Properties of Amorphous Silicon & its Alloys*. INSPEC. The Institution of Electrical Engineers. London. UK. 1998.
- Shanks, H., Fang, C.J., Ley, L., Cardona, M., Demond, F.J. and Kalbitzer, S. (1980). Infrared Spectrum and Structure of Hydrogenated Amorphous Silicon. *Phys. Stat. Solidi*. (b). 100. 43-56.
- Shi Chee Han, Goh Boon Tong, Richard Ritikos, Siti Meriam Ab. Gani, Muhamad Rasat Muhamad and Saadah A. Rahman. (2006). Nanocrystalline silicon thin

- films by RF plasma enhanced chemical vapour deposition. *Jurnal Fizik Malaysia*. 27 (3). 125-128.
- Shi Chee Han, Goh Boon Tong, Richard Ritikos, Siti Meriam Ab. Gani, Muhamad Rasat Muhamad and Saadah A. Rahman. (2007). Deposition of Hydrogenated Nanocrystalline Silicon (nc-Si:H) Films by Plasma Enhanced Chemical Vapour Deposition. *Solid State Sci. & Technol.* 15 (2). 92 - 97.
- Shim, J.-H., Im, S. and Cho, N.-H. (2004). Nanostructural features of nc-Si:H thin films prepared by PECVD. *Appl. Surf. Sci.* 234. 268-273.
- Shindoh, W. and Ohmi, T. (1996). Ion energy, ion flux, and ion mass effects on low - temperature silicon epitaxy using low - energy ion bombardment process. *J. Appl. Phys.* 79. 2347-5.
- Shing, Y.H. (1989). Electron Cyclotron Resonance Deposition and Plasma Diagnostics of a-Si:H and a-C:H Films. *Sol. Cells*. 27. 331-340.
- Shirai, H., Sakuma, Y., Moriya, Y., Fukai, C. and Ueyama, H. (1999). Fast Deposition of Microcrystalline Silicon Using High-Density SiH<sub>4</sub> Microwave Plasma. *Jpn. J. Appl. Phys.* 38. 6629-6635.
- Solomon, I., Drevillon, B., Shirai, H. and Layadi, N. (1993). Plasma deposition of microcrystalline silicon: the selective etching model. *J. Non-Cryst. Solids*. 164-166. 989-992.
- Song, H.Z., Bao, X.M., Li, N.S. and Wu, X.L. (1998). Strong ultraviolet photoluminescence from silicon oxide films prepared by magnetron sputtering. *Appl. Phys. Lett.* 72(3). 356-358.
- Spear, W.E., Willeke, G., Comber, P.G. Le and Fitzgerald, A.G. (1981). Electronic properties of microcrystalline silicon films prepared in a glow discharge plasma. In *Proceedings of the Ninth International Conference on Amorphous and Liquid Semiconductors*. 42. 257-260. *Journal de Physique Colloque*. 121.
- Sterling. H.F., Swann, R.C.G. (1965). Chemical vapour deposition promoted by r.f. discharge. *Solid State Electron*. 8. 653-654.
- Street, R.A. (1991). *Hydrogenated Amorphous Silicon*. Cambridge University Press. Cambridge.
- Svrcek, V., Pelant, I., Kocka, J., Fojtik, P., Rezek, B., Stuchlikova, H, Fejfar, A., Stuchlik, J., Poruba, A. and Tousek, J. (2001). Transport anisotropy in microcrystalline silicon studied by measurement of ambipolar diffusion length. *J. Appl. Phys.* 89(3). 1800-1805.
- Tachibana, K., Mukai, T. and Harima, H. (1991). Measurement of Absolute Densities and Spatial Distributions of Si and SiH in an RF-Discharge Silane Plasma for the Chemical Vapor Deposition of a-Si:H Films. *Jpn. J. Appl. Phys.* 30. L1208-L1211.
- Takeoka, S., Fujii, M. and Hayashi, S. (2000). Size dependent photoluminescence from surface-oxidized Si nanocrystals in a weak confinement regime. *Phys. Rev.* 62. 16820-16825.
- Talukder, G., Cornish, C.L., Jennings, P. and Hefter, G.T. (1993). Annealing effects on hydrogen, oxygen and nitrogen bonding in sputtered a-Si network. *Thin Solid Films*. 223. 167-172.
- Tan Kim Hee. (1997). The structure and optical characteristics of PECVD silicon oxide thin films. MSc Thesis. University of Malaya.
- Tanaka, K. (1989). *Glow-Discharge Hydrogenated Amorphous Silicon*. KTK Scientific Publishers & Kluwer Academic Publishers. Boston.
- Tanaka, K. and Yamasaki, S. (1982). PAS study of gap-state profiles of P-doped and undoped a-Si:H. *Sol. Energy Mater.* 8. 277-283.
- Tanaka, K., Maruyama, E., Shimada, T. and Okamoto, H. (1999). *Amorphous silicon*. John Wiley & Sons. New York.

- Tang, Z., Wang, W., Zhou, B., Wang, D., Peng, S. and He, D. (2009). The influence of  $H_2/(H_2+Ar)$  ratio on microstructure and optoelectronic properties of microcrystalline silicon films deposited by plasma-enhanced CVD. *Appl. Surf. Sci.* 255. 8867-8873.
- Tange, S., Inoue, K., Tonokura, K. and Koshi, M. (2001). Catalytic decomposition of  $SiH_4$  on a hot filament. *Thin Solid Films.* 395. 42-46.
- Tauc, J. (1974). *Amorphous and Liquid Semiconductors.* Plenum Press. London.
- Tauc, J. and Abeles, F. (1972). *Optical Properties of Solids.* North-Holland. Amsterdam. 277.
- Tong, J.F., Hsiao, H.L. and Hwang, H.L. (1999). Adjustable emissions from silicon-rich oxide films prepared by plasma-enhanced chemical-vapor deposition. *Appl. Phys. Lett.* 74(16). 2316-2318.
- Torchynska, T.V. (2009). Emission of Si nanoclusters of different phases in amorphous hydrogenated silicon. *Superlattices and Microstructures.* 45. 267-270.
- Torchynska, T.V., Quintos Vazquez, A.L., Polupan, G., Matsumoto, Y., Khomenkova, L. and Shcherbyna, L. (2008). Correlation between the photoluminescence and different types of Si nano-clusters in amorphous silicon. *J. Non-Cryst. Solids.* 354. 2186-2189.
- Trowaga, P.F., Kenyon, A.J. and Pitt, C.W. (1998). Modeling the contribution of quantum confinement to luminescence from silicon nanoclusters. *J. Appl. Phys.* 83. 3789-6.
- Tsai, C.C., Anderson, G.B., Thompson R. and Wacker, B. (1989). Control of silicon network structure in plasma deposition. *J. Non-Cryst. Solids.* 114. 151-153.
- Tsakalagos, L, Balch, J., Fronheiser, J., Korevaar, B.A., Sulima, O. and Rand, J. (2007). Silicon nanowire solar cells. *Appl. Phys. Lett.* 91. 233117-233119.
- Tsakalagos, L. (2008). Nanostructures for photovoltaics. *Mat. Sci. & Eng. R.* 62. 175-189.
- Tsu, R., Gonzale, Z-Hernandez, Chao, S.S., Lee, S.C., and Tanaka, K. (1982). Critical volume fraction of crystallinity for conductivity percolation in phosphorus - doped Si:F:H alloys. *Appl. Phys. Lett.* 40. 534-2.
- Tsuda, M., Oikawa, S. and Saito, K. (1989). On the primary process in the plasma - chemical and photochemical vapor deposition from silane. III. Mechanism of the radiative species  $Si^*(1P\ 0)$  formation. *J. Chem. Phys.* 91. 6822-8.
- Tubino, R., Piseri, L. and Zerbi, G. (1972). Lattice Dynamics and Spectroscopic Properties by a Valence Force Potential of Diamondlike Crystals: C, Si, Ge, and Sn. *J. Chem. Phys.* 56. 1022-18.
- Vallat-Sauvain, E., Kroll, U., Meier, J. and Shah, A. (2000). Evolution of the microstructure in microcrystalline silicon prepared by very high frequency glow-discharge using hydrogen dilution. *J. Appl. Phys.* 87(6). 3137-3142.
- Veprek, S., Iqbal, Z., Oswald, H.R., Sarott, F.A. and Wagner, J.J. (1981). Parameters controlling the deposition of amorphous and microcrystalline silicon in Si/H discharge plasmas. In *Proceedings of the Ninth International Conference on Amorphous and Liquid Semiconductors.* 42. 251-255. *Journal de Physique Colloque.*
- Veprek, S., Marecek, V. (1968). The preparation of thin layers of Ge and Si by chemical hydrogen plasma transport. *Solid State Electron.* 11(7). 683-684.
- Veprek, S., Wirschem, T., Ruckschlob, M., Tamura, H. and Oswald, J. (1995). Control of the Crystallite Size and Dielectric Tissue in nc-Si/SiO<sub>2</sub> Plasma CVD Films: Origin of the Green/Blue and the Efficiency of the Red Photoluminescence. *Mater. Res. Soc. Symp. Proc.* 358. 99-110.
- Vickerman, J.C. (1997). *Surface analysis – the principal techniques.* John Wiley & Sons.

- Vossen, John L. and Werner Kern. (1978). *Thin Films Processes*. Academic Press. New York.
- Waman, V.S., Kamble, M.M, Pramod, M.R., Gore, S.P., Funde, A.M., Hawaldar, R.R., Amalnerkar, D.P., Sathe, V.G., Gosavi, S.W., Jadkar, S.R. (2011). Influence of the deposition parameters on the microstructure and opto-electrical properties of hydrogenated nanocrystalline silicon films by HW-CVD. *J. Non-Cryst. Solids*. 357. 3616-3622.
- Wang, J., Righini, M., Gnoli, A., Foss, S., Finstad, T., Serincan, U. and Turan, R. (2008). Thermal activation energy of crystal and amorphous nano-silicon in SiO<sub>2</sub> matrix. *Solid State Commun*. 147. (2008) 461-464.
- Wang, X.X., Zhang, J.G., Ding, L., Cheng, B.W., Ge, W.K., Yu, J.Z. and Wang, Q.M. (2005). Origin and evolution of photoluminescence from Si nanocrystals embedded in a SiO<sub>2</sub> matrix. *Phys. Rev. B*. 72. 195313-6.
- Wang, Y.H., Lin, J. and Huan, C.H.A. (2003). Structural and optical properties of a-Si:H/nc-Si:H thin films grown from Ar-H<sub>2</sub>-SiH<sub>4</sub> mixture by plasma-enhanced chemical vapor deposition. *Mater. Sci. & Eng. B*. 104. 80-87.
- Wei, Wensheng, Xu, Gangyi, Wang, Jinliang, Wang Tianmin. (2007). Raman spectra of intrinsic and doped hydrogenated nanocrystalline silicon films. *Vacuum*. 81. 656-662.
- Wei, Wensheng. (2007). One- and two-phonon Raman scattering from hydrogenated nanocrystalline silicon films. *Vacuum*. 81. 857-865.
- Wiesmann, H., Ghosh, A.K., McMahon, T. and Strongin, M. (1979). a - Si : H produced by high - temperature thermal decomposition of silane. *J. Appl. Phys*. 50. 3752-3.
- Willeke, G., Nijs, J. and Mertens, R. (1988). Low temperature microcrystalline silicon compatible with a-Si solar cell design. In Eighth E.C. Photovoltaic Solar Energy Conference. Proceedings of the International Conference. 881.
- Willeke, G., Spear, W.E., Jones, D.I. and Comber, P.G. Le. (1982). Thermoelectric power, hall effect and density-of-states measurements on glow-discharge microcrystalline silicon. *Philosophical Magazine B*. 46(2). 177-190.
- Wu, M.H., Mu, R., Ueda, A., Henderson, D.O. and Vlahavic, B. (2005). Production of silicon quantum dots for photovoltaic applications by picosecond pulsed laser ablation. *Mat. Sci. & Eng B*. 116(3). 273-277.
- Wu, X., Bek, A., Bittner, A.M., Eggs, Ch., Ossadnik, Ch. and Veprek, S. (2003). The effect of annealing conditions on the red photoluminescence of nanocrystalline Si/SiO<sub>2</sub> films. *Thin Solid Films*. 425. 175-184.
- Yamasaki, S. (1987). Optical absorption edge of hydrogenated amorphous silicon studied by photoacoustic spectroscopy. *Philos. Mag*. B56. 79-97.
- Yamasaki, S., Oheda, H., Matsuda, A., Okushi, H. and Tanaka, K. (1982). Gap-State Profiles of a-Si: H Deduced from Below-Gap Optical Absorption. *Jpn. Appl. Phys*. 21. L539-L541.
- Zhang, S., Liao, X., Xu, Y., Martins, R., Fortunato, E. and Kong, G. (2004). The diphasic nc-Si/a-Si:H thin film with improved medium-range order. *J. Non-Cryst. Solids*. 338-340. 188-191.
- Zhang, T., Gao, J., Zhang, H.P., Yang, L.C., Wu, Y.P. and Wu, H.Q. (2007). Preparation and electrochemical properties of core-shell Si/SiO nanocomposite as anode material for lithium ion batteries. *Electrochem. Comm*. 9. 886-890.
- Zhao, Z.X., Cui, R.Q., Meng, F.Y., Zhou, Z.B., Yu, H.C., Sun, T.T. (2005). Nanocrystalline silicon thin films deposited by high-frequency sputtering at low temperature. *Sol. Energy Mater. & Sol. Cells*. 86. 135-144.