

## References

- [1] J. Bardeen and W. H. Brattain, "The Transistor, A Semi-Conductor Triode," *Phys. Rev.*, **74**, p. 230, 1948.
- [2] S. M. Sze, "Physics of semiconductor devices", 2nd ed., John-Wiley & Sons publisher, New York, p. 648, 1991.
- [3] R. H. Fowler and L. W. Nordheim, "Electron emission in intense field," *Proc. R. SOC.*, A229, p. 173, 1928.
- [4] C. A. Spindt, I. Brodie, L. Humpfrey, and E. R. Westerberg, "Electrical properties of thin-film field emission cathodes with molybdenum cones," *J. Appl. Phys.*, Vol. 47, p. 5248, 1976.
- [5] R. Meyer, "Recent development on microtips display at LETI," *IVMC'91 Technical Digest*, p. 6, 1991.
- [6] N. E. McGruer and K. Warner, "Oxidation-sharpened gated field emitter array process," *IEEE Trans. Electron Devices*, Vol. 38, No. 10, p. 488, 1991.
- [7] S. E. Huq and L. Chen, "Fabrication of sub-10 nm silicon tips: a new approach," *J. Vac. Sci. & Technol. B*, Vol. 13(6), p. 2718, 1995.
- [8] D. W. Branston and D. Stephani, "Field emission from metal-coated Silicon tips," *IEEE Trans. Electron Devices*, Vol. 38, No. 10, p. 2329, 1991.
- [9] V. V. Zhirnov and E. I. Givargizov, "Field emission from silicon spikes with diamond coating," *J. Vac. Sci. & Technol. B*, Vol. 13(2), p. 418, 1995.

- [10] J. H. Jung and B. K. Ju, "Enhancement of electron emission efficiency and stability of molybdenum field emitter array by diamond-like carbon coating," IEEE IEDM'96, p. 293, 1996.
- [11] R. E. Burgess, H. Kroemer, and J. M. Honston, "Corrected value of Fowler-Norheim field emission function  $v(y)$  and  $s(y)$ ," Phys. Rev., Vol. 1, No. 4, p. 515, May, 1953.
- [12] R. B. Marcus, T. S. Ravi, T. Gmitter, H. H. Busta, J. T. Niccum, K. K. Chin, and D. Liu, "Atomically sharp silicon and metal field emitters," IEEE Trans. Electron Devices, Vol. 38, p. 2289, 1991.
- [13] P. Vaudaine and R. Meyer, "Microtips fluorescent display," IEEE IEDM'91, p. 197, 1991.
- [14] C. Curtin, "The field emission display," International Display Research Conference p. 12, 1991.
- [15] C. A. Spindt, C. E. Holland, I. Brodie, J. B. Mooney, and E. R. Westerberg, "Field-emitter array applied to vacuum fluorescent displays," IEEE Trans. Electron Devices, Vol. 36, No. 1, p. 225, 1989.
- [16] David A. Cathey, "Field emission displays," Information Display, p. 16, Oct., 1995.
- [17] "Pixtech to produce color FEDs from November," News reported in Nikkei

Electronics ASIA, p. 42, Nov., 1995.

- [18] H. G. Kosmahl, "A wide-bandwidth high-gain small size distributed amplifier with field-emission triodes (FETRODE's) for the 10 to 300 GHz frequency range," IEEE Trans. Electron Devices, Vol. 36, No.11, p. 2715, 1989.
- [19] P. M. Larry, E. A. Netteshiem, Y. Goren, C. A. Spindt, and A. Rosengreen, "10 GHz turned amplifier based on the SRI thin film field emission cathode," IEEE IEDM'88, p. 522, 1988.
- [20] C. A. Spindt, C. E. Hollard, A. Rosengreen, and I. Brodie, "Field emitter array development for high frequency operation," J. Vac. Sci. & Technol. B, Vol. 11, p. 486, Mar./Apr., 1993.
- [21] C. A. Spindt, "Microfabricated field emission and field ionization sources," Surface Science, Vol. 266, p. 145, 1992.
- [22] T. H. P. Chang, D. P. Kern, et al., "A scanning tunneling microscope controlled field emission micro probe system," J. Vac. Sci. & Technol. B, Vol. 9, p. 438, Mar./Apr., 1991.
- [23] H. H. Busta, J. E. Pogemiller, and B. J. Zimmerman, "The field emission triode as a displacement/process sensor," J. Micromech. Microeng., p. 45, 1993.
- [24] H. C. Lee and R. S. Huang, "A novel field emission array pressure sensor," IEEE Transducers- International Solid-State Sensors and Actuators, p. 126,

1991.

- [25] D. G. Fink and D. Christiansen, *Electronic Engineering Handbook*, McGraw-Hill, New York, 1989.
- [26] H. Imura, S. Tsuida, M. Takahasi, A. Okamoto, H. Makishima, and S. Miyano, "Electron gun design for traveling wave tubes (TWTs) using a field emitter array (FEA) cathode," *IEEE IEDM'97*, p. 721, 1997.
- [27] S. Itoh, T. Watanabe, T. Yamaura, and K. Yano, "A challenge to field emission displays," in *Proc. Asia Display*, p. 617–620. Oct. 1995
- [28] C. A. Spindt, I. Brodie, L. Humphrey, and E. R. Westerberg, "Physical properties of thin-film field emission cathodes with molybdenum cones," *J. Appl. Phys.*, vol. 47, no. 12, p. 5248–5263, 1976.
- [29] R. Meyer, A. Ghis, P. Rambaud, and F. Muller, "Microtips fluorescent display," in *Proc. Japan Display*, , p. 512–515. Sept./Oct. 1986
- [30] S. Itoh AND M. Tanaka, "Current Status of Field-Emission Displays", *PROCEEDINGS OF THE IEEE*, VOL. 90, NO. 4, April, 2002
- [31] M. Ding, H. Kim, and A. I. Akinwande" Highly Uniform and Low Turn-On Voltage Si Field Emitter Arrays Fabricated Using Chemical Mechanical Polishing", *IEEE ELECTRON DEVICE LETTERS*, VOL. 21, NO. 2, FEBRUARY, 2000

- [32] X. Xu and G. R. Brandes, "A method for fabricating large-area, patterned, carbon nanotube field emitters," *Appl. Phys. Lett.*, Vol. 74, p. 2549, 1999.
- [33] A. M. Rao, D. Jacques, and R. C. Haddon, "In situ-grown carbon nanotube arrays with excellent field emission characteristics," *Appl. Phys. Lett.*, Vol. 76, p. 3813, 2000.
- [34] H. Murakami, M. Hirakawa, C. Tanaka, and H. Yamakawa, "Field emission from well-aligned, patterned, carbon nanotube emitters," *Appl. Phys. Lett.*, Vol. 76, p. 1176, 2000.
- [35] W. B. Choi, D. S. Chung, J. H. Kang, H. Y. Kim, Y. W. Jin, I. T. Han, Y. H. Lee, J. E. Jung, N. S. Lee, G. S. Park, and J. M. Kim, "Fully sealed, high-brightness carbon-nanotube field-emission display," *Appl. Phys. Lett.*, Vol. 75, p. 3129, 1999
- [36] R. Baker, M. Barber, P. Harris, F. Feates, and R. Waite, "Nucleation and growth of carbon deposits from the nickel catalyzed decomposition of acetylene" *Journal of catalysis* , Vol. 26, iss.7 p. 51,1972
- [37] G.Tibbets," Why are carbon filaments tubular?" *J.Cryst.Growth* , Vol. 66,p. 632-638, 1984
- [38] P.Tsener, E.Robinovich,I. Rafalkes, and E.Arefieva, "FORMATION OF CARBON FIBRES FROM ACETYLENE" ,*Carbon*. Vol. 8, no. 4, p.

435-442. Oct. 1970

- [39] A. Oberlin, M. Endo, and T. Koyama, "Filamentous growth of carbon through benzene decomposition" *J. Cryst. Growth*, Vol. 32, p. 335-349, 1976
- [40] F. Derbyshire, A. P. Resland, and D. Trimm, "Graphite formation by the dissolution—precipitation of carbon in cobalt, nickel and iron" *Carbon* Vol. 13, p. 111-113, 1975
- [41] Q. Jiang, N. Aya, and F. G. Shi, "Nanotube size-dependent melting of single crystals in carbon nanotubes," *Appl. Phys. A* 64, p. 627-629, 1997
- [42] K. K. Nanda, S. N. Sahu, and S. N. Behera, "Liquid-drop model for the size-dependent melting of low-dimensional systems," *Physical Review A* 66, 013208, 2002
- [43] M. Aldén, H. L. Skriver, S. Mirbt, and B. Johansson, "Surface magnetism in iron, cobalt, and nickel," *Phys. Rev. Lett.* 69, p. 2296–2298, 1992
- [44] S. Hofmann, C. Ducati, B. Kleinsorge, and J. Robertson, "Direct growth of aligned carbon nanotube field emitter arrays onto plastic substrates," *App. Phys. Lett.*, Vol. 83, No. 22, 2003
- [45] H. L. Skriver and N. M. Rosengaard, "Surface energy and work function of elemental metals," *Phys. Rev. B* 46, p. 7157 - 7168, 1992
- [46] M. P. Siegal, D. L. Overmyer, and F. H. Kaatz, "Controlling the site density of multiwall carbon nanotubes via growth conditions," *App. Phys. Lett.*, Vol. 84, No. 25, p. 5156-5158, 2004

- [47] Jiang, Q., Tong, H.Y., Hsu, D.T., Okuyama, K., and Shi, F.G., "Thermal stability of crystalline thin films," *Thin Solid Films*. Vol. 312, p. 357-361, 1998
- [48] de los Arcos, T.; Wu, Z.M.; and Oelhafen, P., "Is Aluminum a suitable buffer layer for carbon nanotube growth?," *Chemical Physics Letters* vol. 380, p. 419-423, 2003
- [49] Teresa de los Arcos, M. Gunnar Garnier, Peter Oelhafen, Daniel Mathys, Jin Won Seo, Concepción Domingo, José Vicente García-Ramos and Santiago Sanchez-Cortes, "Strong influence of buffer layer type on carbon nanotube characteristics," *Carbon* 42, p. 187-190, 2004
- [50] Y. Wang, Bin. Lin, Paul S. Ho, "Effect of supporting layer on growth of carbon nanotubes by thermal chemical vapor deposition" *App. Phys. Lett.*, Vol. 89, No. 183113, p. 1-3, 2006
- [51] K. M. Lee, H.J. Han, S. Choi, Kyung Ho Park, "Effects of metal buffer layers on the hot filament chemical vapor deposition of nanostructured carbon films" *J. Vac. Sci. Technol. B* 21(1) p. 623-626, 2003
- [52] J. M. Bonard, J. P. Salvetat, T. Stockli, W. A. de Heer, L. Forro, and A. Chatelain, "Field emission from single-wall carbon nanotube films" *Appl. Phys. Lett.* Vol. 73, p. 918, 1998
- [53] F. G. Tantair, L. C. Chen and S. L. Wei, W. K. Hong, K. H. Chen, H. C. Cheng

“High current density field emission from arrays of carbon nanotubes and diamond-clad Si tips” J. Vac. Sci. Technol. B 18(3) p.1207, 2000

- [54] N. S. Lee, W. B. Choi, W. K. Yi, Y. W. Jin, Y. S. Choi, J. E. Jung, S. G. You, J. H. You, C. G. Lee, S. H. Cho, J. M. Ki “The carbon-nanotubes based field-emission displays for future large and full color displays” Microprocesses and Nanotechnology Conference, 2000 International, p.124, 2000

- [55] Q. H. Wang, M. Yan, and R. P. H. Chang “Flat panel display prototype using gated carbon nanotube field emitters” Appl. Phys. Lett. Vol. 78, p. 1294, 2001



- [56] Huang-Chung Cheng, Kuo-Ji Chen, Wei-Kai Hong, Fu-Gow Tantai, Chia-Pin Lin, Kuei-Hsien Chen, and Li-Chyong Chen,” Fabrication and Characterization of Low Turn-On Voltage Carbon Nanotube Field Emission Triodes,” Electrochemical and Solid-State Letters, 4 (8) H15-H17 H16, 2001

- [57] K.Ono, M.Hirakawa, O.Miura, and H.Murakami,” Effects of metal buffer layers on the hot filament chemical vapor deposition of nanostructured carbon films,” J. Vac. Sci. Technol. B 21.1., Jan/Feb 2003

- [58] Kyung Moon Lee, Hyung Jun Han, Seungho Choi, Kyung Ho Park, Soo-ghae Oh, Soonil Lee, and Ken Ha Koh,” Optimization of Graphite Nanofibers as Field Electron Emitters ,”IDW’02, p.1089-1092, ULVAC,



Inc., Japan

- [59] YH Lee, DH Kim, DH Kim, BK Ju . “Magnetic catalyst residues and their influence on the field electron emission characteristics of low temperature grown carbon nanotubes” Appl. Phys. Lett. Vol. **89**, 083113 , 2006
- [60] S. Hofmann, C. Ducati, B. Kleinsorge, and J. Robertson  
“Direct growth of aligned carbon nanotube field emitter arrays onto plastic substrates” Appl. Phys. Lett. Vol. 83, NUM 22,p.4661, 2003
- [61] W.H. Wang, K.M. Chao and C.T. Kuo “Process and characteristics of the large area well-aligned CNTs with open ends by electron cyclotron resonance chemical vapor deposition” Diamond & Related Materials, Vol. 14, Iss. 3-7 , P. 753-757, 2005
- [62] J ZHANG, XI WANG, W YANG, W YU, TAO FENG, Q LI, X “Interaction between carbon nanotubes and substrate and its implication on field emission mechanism” ,Carbon, Vol.44, p.418-422, 2006
- [63] YM Wong, WP Kang, JL Davidson, KL Soh, BK Choi, W “Carbon nanostructure field emission devices” J. Vac. Sci. Technol. B 24,. Vol 24, Iss 2, p.. 1008-1012, March 2006
- [64] JH Choi, TY Lee, SH Choi, JH Han, JB Yoo, CY Park “ Density control of carbon nanotubes using NH<sub>3</sub> plasma treatment of Ni catalyst layer” Thin

Solid Films ,Vol. 435, Iss. 1-2, P.318-323 , July 2003

- [65] J Kim, K No, CJ Lee "Growth and field emission of carbon nanotubes on electroplated Ni catalyst coated on glass substrates" Journal of Applied Physics. vol:90, iss:5 p.:2591, 2001
- [66] Lee, CJ;Park, J.; Han, S.; Ihm, J., "Growth and field emission of carbon nanotubes on sodalime glass at 550 °C using thermal CVD" Chem. Phys. Lett. p. 398-402, 2001
- [67] Y Shiratori, H Hiraoka, Y Takeuchi, S Itoh, M, "One-step formation of aligned carbon nanotube field emitters at 400 °C" Appl. Phys. Lett. Vol. 82, Iss 15, p. 2485-2487 , 2003
- [68] G Takeda, L Pan, S Akita, Y Nakayama, "Vertically Aligned Carbon Nanotubes Grown at Low Temperatures for Use in Displays " J. Journal of Applied Physics Vol. 44, No. 7B, p. 5642-5645, 2005

