

## References

1. Yoshinori, N. *Introduction to Metal Matrix Composites*. (Springer, 2013). doi:10.1007/978-4-431-54237-7
2. Kainer, K. & Partikel, K. Fund Kurzfasern für eine Verstärkung von metallischen Werkstoffen. Metallische Verbundwerkstoffe. *DGM Informationsgesellschaft, Oberursel* 43–64 (1994).
3. Iijima, F. S. Helical microtubules of graphite carbon. *Nature* **354**, 56–68 (1991).
4. Lacerda, L., Bianco, A., Prato, M. & Kostarelos, K. Carbon nanotubes as nanomedicines: From toxicology to pharmacology. *Adv. Drug Deliv. Rev.* **58**, 1460 – 1470 (2006).
5. So, K. P. *et al.* Improving the wettability of aluminum on carbon nanotubes. *Acta Mater.* **59**, 3313–3320 (2011).
6. Tjong, S. C., Liang, G. D. & Bao, S. P. Electrical behavior of polypropylene/multiwalled carbon nanotube nanocomposites with low percolation threshold. *Scr. Mater.* **57**, 461–464 (2007).
7. Kang, Y.-C. & Chan, S. L.-I. Tensile properties of nanometric Al<sub>2</sub>O<sub>3</sub> particulate-reinforced aluminum matrix composites. *Mater. Chem. Phys.* **85**, 438–443 (2004).
8. Oberlin, A., Endo, M. & Koyama, T. Filamentous growth of carbon through benzene decomposition. *J. Cryst. Growth* **32**, 335–349 (1976).
9. Monthoux, M. & Kuznetsov, V. L. Who should be given the credit for the discovery of carbon nanotubes? *Carbon N. Y.* **44**, 1621–1623 (2006).
10. Radushkevich, L. V., Lukyanovich, V. M. & O'strukture, U. Obrazujucegosja pri termiceskom razlozenii okisi ugleroda na zeleznom kontakte. *Zurn Fis. Chim* **26**, 88–95 (1952).
11. Bacon, R. Growth, structure, and properties of graphite whiskers. *J. Appl. Phys* **31**, 283–290 (1960).
12. Iijima, S. & Ichihashi, T. Single-shell carbon nanotubes of 1-nm diameter. *Nature* **363**, 603–605 (1993).
13. Buthene, D. *et al.* Cobalt-catalyzed growth of carbon nanotubes with singleatomic-layer walls. *Nature* **363**, 605–607 (1993).
14. Shenderova, O. A., Hu, Z. & Brenner, D. B. in *Carbon Family at the Nanoscale* 1–14 (NATO Science Series Volume 192, 2005).

15. Heimann, R. B., Evsyukov, S. E. & Koga, Y. Carbon allotropes: A suggested classification scheme based on valence orbital hybridization. *Carbon N. Y.* **35**, 1654–1658 (1997).
16. Kroto, H., Heath, J., O'Brien, C., Curl, R. & Smalley, E. C<sub>60</sub>: Buckminsterfullerene. *Nature* **318**, 162–163 (1985).
17. Rao, C. N., Seshadri, R., Govindaraj, A. & Sen, R. Fullerenes, nanotubes, onions and related carbon structures. *Mater. Sci. Eng. R* **15**, 209–262 (1995).
18. Yamabe, T. Recent development of carbon nanotubes. *Synth. Met.* **70**, 1511–1518 (1995).
19. Thostenson, E., Ren, Z. & Chou, T. Advances in science and technology of carbon nanotubes and their applications: a review. *Compos. Sci. Technol.* **61**, 1899–1912 (2001).
20. Dresselhaus, M. S., Dresselhaus, G. & Saito, R. Physics of carbon nanotubes. *Carbon N. Y.* **33**, 883–891 (1995).
21. CSIRO Developing Workplace Safe Work Australia., <http://www.safeworkaustralia.gov.au/NR/rdonlyres/D0C34549-4EB1-4F12-A6F7-0891E1CA48EF/0/DevelopingWorkplaceDetectionandMeasurementTechniquesforCarbonNanotubes.pdf>.%20, Last accessed on 5th May, 2014. (2010). at <<http://www.safeworkaustralia.gov.au/NR/rdonlyres/D0C34549-4EB1-4F12-A6F7-0891E1CA48EF/0/DevelopingWorkplaceDetectionandMeasurementTechniquesforCarbonNanotubes.pdf>>
22. Mercer, R. R. *et al.* Alteration of deposition pattern and pulmonary response as a result of improved dispersion of aspirated single-walled carbon nanotubes in a mouse model. *Cell Mol Physiol. Am. J. Physiol. Cell. Mol. Physiol.* **294**, L87–97 (2008).
23. Pauluhn, J. Subchronic 13-week inhalation exposure of rats to multiwalled carbon nanotubes: Toxic effects are determined by density of agglomerate structures, not fibrillar structures. *Toxicol. Sci.* **113**, 226–242 (2010).
24. Donaldson, K. *et al.* Carbon nanotubes: A review of their properties in relation to pulmonary toxicology and workplace safety. *Toxicol. Sci.* **92**, 5–22 (2006).
25. Saito, R., Dresselhaus, M. S. & Dresselhaus, S. *Physical Properties of Carbon Nanotubes*. (Imperial College Press., 1998).
26. Biercuk, M. *et al.* Carbon nanotube composites for thermal management. *Appl. Phys. Lett.* **80**, 2767–2769 (2002).

27. Dai, H. *et al.* Electrical transport properties and field effect transistors of carbon nanotubes. *NANO Br. Reports Rev.* **1**, 1–4 (2006).
28. Issi, J. P., Langer, L., Heremans, J. & Olk, C. H. Electronic properties of carbon nanotubes: Experimental results. *Carbon N. Y.* **33**, 941–948 (1995).
29. Wang, X. K. *et al.* Properties of buckytubes and derivatives. *Carbon N. Y.* **33**, 949–958 (1995).
30. Gui, X. C. *et al.* Microwave absorbing properties and magnetic properties of different carbon nanotubes. *Sci. China Technol. Sci.* **52**, 227–231 (2009).
31. *FactSage 5.2, GTT Technologies, Kaiserstr. 100, 52134 , Germany,*. (2003).
32. Hone, J., Batlogg, B., Benes, J., Johnson, A. & Fisher, J. Quantized phonon spectrum of single-wall carbon nanotubes. *Science (80-.)* **289**, 1730–1733 (2000).
33. Yi, W., Lu, L., Zhang, D. L., Pan, Z. W. & Xie, S. S. Linear specific heat of carbon nanotubes. *Phys. Rev. B* **59**, 9015–9018 (1999).
34. Buerschaper, R. A. Thermal and electrical conductivity of graphite and carbon at low temperatures. *J. Appl. Phys.* **15**, 452–454 (1944).
35. Berber, S., Kwon, Y. & Tomanek, D. Unusually high thermal conductivity of carbon nanotubes. *Phys. Rev. Lett.* **84**, 4613–4616 (2000).
36. Hone, J., Whitney, M., Piskoti, C. & Zettl, A. Thermal conductivity of single-walled carbon nanotubes. *Phys. Rev. B* **59**, 2514–2516 (1999).
37. Hone, J. *et al.* Electrical and thermal transport properties of magnetically aligned single wall carbon nanotubes films. *Appl. Phys. Lett.* **77**, 666–668 (2000).
38. Kim, P., Shi, L., Majumdar, A. & McEuen, P. L. Thermal transport measurements of individual multiwalled nanotubes. *Phys. Rev. Lett.* **87**, 215502 (1–4) (2001).
39. Qin, C., Shi, X., Bai, S. Q., Chen, L. D. & Wang, L. J. High temperature thermal and electrical properties of bulk carbon nanotube prepared by SPS. *Mater. Sci. Eng. A.* **420**, 208–211 (2006).
40. Forro, L. & Schonenberger, C. ‘Multiwall Carbon Nanotubes.’ *Physics World*, June (2000).
41. Shin, M. K. *et al.* Synergistic toughening of composite fibres by self-alignment of reduced graphene oxide and carbon nanotubes. *Nat. Commun.* **3**, 650 (2012).

42. Walter, D. *et al.* Elastic strain of freely suspended single walled carbon nanotubes ropes. *Appl. Phys. Lett.* **74**, 3803–3805 (1999).
43. Yu, M. F., Dyer, M. J., Oloni, K., Kelley, T. F. & Ruoff, R. Strength and breaking mechanism of multiwalled carbon nanotubes under tensile loads. *Science (80-.)* **287**, 637–640 (2000).
44. Demczyk, B. G. *et al.* Direct mechanical measurements of the tensile strength and elastic modulus of multi-walled carbon nanotubes. *Mater. Sci. Eng. A.* **334**, 173–178 (2002).
45. Treacy, M. M., Ebbesen, T. W. & Gibson, J. M. Exceptionally high Young's modulus observed for individual carbon nanotubes. *Nature* **381**, 678–680 (1996).
46. Wong, E. W., Sheehan, P. E. & Lieber, C. Nanobeam mechanics: elasticity, strength and toughness of nanorods and nanotubes. *Science (80-.)* **277**, 1971–5 (1997).
47. Salvetat, J. P. *et al.* Elastic modulus of ordered and disordered multi-walled carbon nanotubes. *AdvancedMaterials* **11**, 161–165 (1999).
48. Xie, S., Li, W., Pan, Z., Chang, B. & Sun, L. Mechanical and physical properties on carbon nanotube. *J. Phys. Chem. Solids* **61**, 1153–1158 (2000).
49. Ebbesen, T. Carbon nanotubes. *Annu. Rev. Mater. Sci.* **24**, 235–241 (1994).
50. Iijima, S., Ajayan, P. M. & Ichihashi, T. Growth model for carbon nanotubes. *Phys. Rev. Lett.* **69**, 3100–3103 (1992).
51. Ijiima, S. Growth of carbon nanotubes. *Mater. Sci. Eng. B* **19**, 172–180 (1993).
52. Ebbesen, T. & Ajayan, P. Large-scale synthesis of carbon nanotubes. *Nature* **358**, 220–222 (1992).
53. Lee, S. J., Baik, H. K., Yoo, J. E. & Han, J. H. Large scale synthesis of carbon nanotubes by plasma rotating arc discharge technique. *Diam. Relat. Mater.* **11**, 914–917 (2002).
54. Hsin, Y. L., Hwang, K. C., Chen, F. R. & Kai, J. J. Production and in-situ metal filling of carbon nanotubes in water. *Adv. Mater.* **13**, 830–835 (2001).
55. Jung, S. H. *et al.* High-yield synthesis of multi-walled carbon nanotubes by arc discharge in liquid nitrogen. *Appl. Phys. A* **76**, 285–286 (2003).
56. Beck, M. T., Dinya, Z., Keki, S. & Papp, L. Formation of C<sub>60</sub> polycyclic aromatic hydrocarbons upon electric discharge in liquid toluene Tetrahedron. *Carbon N. Y.* **49**, 285–290 (1993).

57. Hosseini, A. A., Allahyari, M. & Daftari, B. S. Synthesis of carbon nanotubes, nano fibbers and nano union by electric arc discharge method using NaCl accuse as solution and Fe and Ni particles and catalysts. *Int. J. Sci. Environ. Technol.* **1**, 217 – 229 (2012).
58. Kroto, H. W., Heath, J. R., OBrien, S. C., Curl, R. F. & Smalley, R. E. C60: Buckminster fullerene,. *Nature* **318**, 162–165 (1985).
59. Thess, A. *et al.* Crystalline ropes of metallic carbon nanotubes,. *Science (80-.)* **273**, 483–487 (1996).
60. Maser, W. K. *et al.* Production of high-density single-walled nanotube material by a simple laser-ablation method. *Chem. Phys. Lett.* **292**, 587–593 (1998).
61. Tjong, S. C. *Carbon Nanotube Reinforced Composites-Metal and Ceramic Matrices*. (WILEY-VCH Verlag GmbH & Co, 2009).
62. Ohring, F. M. *Materials Science of Thin Film: Deposition and Structure*. (Academic Press, 2002).
63. Gemming, T. *et al.* Eutectic limit for the growth of carbon nanotubes from a thin iron film by chemical vapor deposition of cyclohexane. *Chem. Phys. Lett.* **425**, 301–305 (2006).
64. Hong, Y. K. *et al.* Controlled two-dimensional distribution of nanoparticles by spin-coating method. *Appl. Phys. Lett.* **80**, 844–846 (2002).
65. Lee, C. J., Lyu, S. C., Cho, Y. R., Lee, J. H. & Cho, K. I. Diameter-controlled growth of carbon nanotubes using thermal chemical vapor deposition. *Chem. Phys. Lett.* **341**, 245–249 (2001).
66. Choi, Y. C. *et al.* Controlling the diameter, growth rate, and density of vertically aligned carbon nanotubes synthesized by microwave plasma enhanced chemical vapor deposition. *Appl. Phys. Lett.* **76**, 2367–2369 (2000).
67. Ago, H., Nakamura, K., Uehara, N. & Tsuji, M. Roles of meal-support interaction in growth of single- and double-walled carbon nanotubes studied with diameter- controlled iron particles supported on MgO. *J. Phys. Chem. B* **108**, 18908–18915 (2004).
68. Farhat, S. *et al.* Diameter control of single-walled carbon nanotubes using argon-helium mixture gases. *J. Chem. Phys.* **115**, 6752–6759 (2001).
69. Naiqin, Z., Chunlian, H., Zhaoyang, J., Jiajun, L. & Yongdan, L. Fabrication and growth mechanism of carbon nanotubes by catalytic chemical vapor deposition. *Mater. Lett.* **60**, 159 – 163 (2006).
70. Merkulov, V. I., Melechko, A. V, Guillorn, M. A., Lowndes, D. H. & Simpson, M. L. Alignment mechanism of carbon nanofibers produced by

- plasma-enhanced chemical-vapor deposition. *Appl. Phys. Lett.* **79**, 2970–2972 (2001).
71. Baker, R. T. K., Barber, M. A., Harris, P. S., Feates, F. S. & Waite, R. J. Nucleation and growth of carbon deposits from the nickel catalyzed decomposition of acetylene. *J. Catal.* **26**, 51–62 (1972).
  72. Baker, R. T. K. & Waite, R. J. Formation of Carbonaceous Deposits from the Platinum-Iron Catalyzed Decomposition of Acetylene 101. *J. Catal.* **37**, 101–110 (1975).
  73. Meyyappan, M., Lance, D., Alan, C. & David, H. Carbon nanotube growth by PECVD: a review. *Plasma Sources Sci. Technol.* **12**, 205–216 (2003).
  74. Liao, H. W. & Hafner, J. H. Low-temperature single-wall carbon nanotube synthesis by thermal chemical vapor deposition. *J. Phys. Chem. B* **108**, 6941–6948 (2004).
  75. Tessonniere, J.-P. & Su, D. S. Recent progress on the growth mechanism of carbon nanotubes: a review. *ChemSusChem* **4**, 824–47 (2011).
  76. Qingwen, L., Hao, Y., Jin, Z. & Zhongfan, L. Dependence of the Formation of Carbon Nanotubes on the Chemical Dependence of the Formation of Carbon Nanotubes on the Chemical Structures of Hydrocarbons. *Adv. Nano-materials Nano-devices* 10–14 (2002).
  77. Kong, J., Cassell, A. M. & Dai, H. Chemical vapor deposition of methane for single-walled carbon nanotubes. *Chem. Phys. Lett.* **292**, 567–572 (1998).
  78. Fan, S. *et al.* Self-oriented regular arrays of carbon nanotubes and their field emission properties. *Science (80-. ).* **283**, 512–515 (1999).
  79. Endo, M. *et al.* The production and structure of pyrolytic carbon nanotubes (PCNTs). *J. Phys. Chem. Solids* **54**, 1841–1849 (1993).
  80. José-Yacamán, M., Jose-Yacaman, M., Miki-Yoshida, M., Rendon, L. & Santiesteban, S. G. Catalytic growth of carbon microtubules with fullerene structure. *Appl. Phys. Lett.* **62**, 657–663 (1993).
  81. Wei, B. Q. *et al.* Organized assembly of carbon nanotubes. *Nature* **416**, 495–497 (2002).
  82. Maruyama, S., Kojima, R., Miyauchi, Y., Chiashi, S. & Kohno, M. Low-temperature synthesis of high-purity single-walled carbon nanotubes from alcohol. *Chem. Phys. Lett.* **360**, 229–234 (2002).
  83. Murakami, Y., Yamakita, S., Okubo, T. & Maruyama, S. Single-walled carbon nanotubes catalytically grown from mesoporous silica thin film. *Chem. Phys. Lett.* **375**, 393–398 (2003).

84. Xiang, R., Einarsson, E., Okawa, J., Miyauchi, Y. & Maruyama, S. Acetylene accelerated alcohol catalytic CVD growth of vertically aligned single walled carbon nanotubes. *J. Phys. Chem. C* **113**, 7511–7520 (2009).
85. Mendozaa, D., Santiago, P. & Reyes P'erez, E. Carbon nanotubes produced from hexane and ethanol. *Rev. Mex. F'Isica* **52**, 1–5 (2006).
86. Anna, M., Albert, G. N. & Esko, I. K. The role of metal nanoparticles in the catalytic production of single-walled carbon nanotubes—a review. *J. Phys. Condens. Matter* **15**, S3011–S3035 (2003).
87. Ding, F. *et al.* Strong SWNT-catalyst adhesion strength as a necessary condition for single-walled carbon nanotube growth. *Nano Lett.* **8**, 463–466 (2008).
88. Horvath, Z. E. *et al.* Inexpensive, upscalable nanotube growth methods. *Curr. Appl. Phys.* **6**, 135–140 (2006).
89. Rümmeli, M. H. *et al.* Novel catalysts for low temperature synthesis of single wall carbon nanotubes. *Phys. Status Solidi* **243**, 3101–3105 (2006).
90. Th. Dikinos, M. *et al.* CVD synthesis of carbon nanotubes on different substrates, Carbon Nanotubes. *NATO Sci. Ser. II Math. Phys. Chem.* **222**, 59–60 (2006).
91. Hernadi, K. *et al.* On the role of catalyst, catalyst support and their interaction in synthesis of carbon nanotubes by CCVD. *Mater. Chem. Phys.* **77**, 536–541 (2002).
92. Nam, T. H., Requena, G. & Degischer, P. Thermal expansion behavior of aluminum matrix composites with densely packed SiC particles. *Compos. A* **39**, 856–865 (2008).
93. Spowart, J. E. & Micracle, D. The influence of reinforcement morphology on the tensile response of 6061/SiC/25p discontinuously reinforced aluminum. *Mater. Sci. Eng. A* **357**, 111–123 (2003).
94. Ma, Z. Y. *et al.* Nanometric Si<sub>3</sub>N<sub>4</sub> particulate-reinforced aluminum composite. *Mater. Sci. Eng. A* **219**, 229–231 (1996).
95. Gü'l, H., Kılıç, F., Aslan, S., Alp, A. & Akbulut, H. Characteristics of electro-co-deposited Ni-Al<sub>2</sub>O<sub>3</sub> nano-particle reinforced metal matrix composite (MMC) coatings. *Wear* **267**, 976–990 (2009).
96. Cao, G. & Li, X. Mechanical properties and microstructure of SiC reinforced Mg-(2,4)Al-Si nanocomposites fabricated by ultrasonic cavitation based solidification processing. *Mater. Sci. Eng. A* **486**, 357–362 (2008).

97. Hansang, K., Dae, H. P., Jean, F. S. & Akira, K. Investigation of carbon nanotube reinforced aluminum matrix composite materials. *Compos. Sci. Technol.* **70**, 546–550 (2010).
98. Kuzumaki, T., Miyazawa, K., Ichinose, H. & Ito, K. Processing of carbon nanotube reinforced aluminum composite. *J. Mater. Res.* **13**, 2445–2449 (1998).
99. Ci, L., Ryu, Z., Phillip, N. Y. & Ruhle, M. Investigation of the interfacial reaction between multi-walled carbon nanotubes and aluminum. *Acta Mater.* **54**, 5367–5375 (2006).
100. Chen, W. X. *et al.* Tribological application of carbon nanotubes in a metal-based composite coating and composites. *Carbon N. Y.* **41**, 215–222 (2003).
101. Carreno-Morelli, E. *et al.* Carbon nanotube/magnesium composites. *Phys. Status Solidi-A* **201**, R53–R55 (2004).
102. Lau, K. T. & Hui, D. (2002). Effectiveness of using carbon nanotubes as nano reinforcements for advanced composite structures. *Carbon N. Y.* **40**, 1597–1617 (2002).
103. Esawi, A. M. K. & Borady, M. A. E. Carbon nanotube-reinforced aluminium strips. *Compos. Sci. Technol.* **68**, 486–492 (2008).
104. Pérez-Bustamante, R. *et al.* Microstructural characterization of Al-MWCNT composites produced by mechanical milling and hot extrusion. *J. Alloys Compd.* **495**, 399–402 (2010).
105. Choi, H. J., Shin, J. H., Min, B. H. & Bae, D. H. Deformation behavior of Al-Si alloy based nanocomposites reinforced with carbon nanotubes. *Compos. A* **41**, 327–329 (2010).
106. Wang, X. & Cai, X. Strengthening in CNT-Al composites produced by high energy ball milling. Advanced materials research. *Adv. Mater. Res.* **236-239**, 2336–2339 (2011).
107. Hansang, K. & Marc, L. Hot extruded carbon nanotube reinforced aluminum matrix composite materials. *Nanotechnology* **23**, 1–14 (2013).
108. Gang, Y., Xiao-Ian, C., Kai-jun, A., Hong-ping, A. & Ya-guang, C. Interface reaction of CNTs/Al fabricated by high energy ball milling. *Adv. Mater. Res.* **750-752**, 90–94 (2013).
109. Kim, I. Y. *et al.* Friction and wear characteristics of the carbon nanotube–aluminum composites with different manufacturing conditions. *Wear* **267**, 593–598 (2009).
110. Saheb, N. Effect of Processing on the Dispersion of CNTs in Al-Nanocomposites. *Adv. Mater. Res.* **239 - 242**, 759–763 (2011).

111. Huang, Y. Y. & Terentjev, E. M. Dispersion of Carbon Nanotubes: Mixing, Sonication, Stabilization, and Composite Properties. *Polymers (Basel)*. **4**, 275–295 (2012).
112. Al-Aqeeli, N. Processing of CNTs Reinforced Al-Based Nanocomposites Using Different Consolidation Techniques. *J. Nanomater.* **370785**, 1–10 (2013).
113. Deng, C. F., Wang, D. Z., Zhang, X. X. & Li, A. B. Processing and properties of carbon nanotubes reinforced aluminum composites. *Mater. Sci. Eng. A* **444**, 138–145 (2007).
114. Noguchi, T. *et al.* Carbon nanotube/aluminum composites with uniform dispersion. *Mater. Trans.* **45**, 602–604 (2004).
115. Junichi, Y. *et al.* Fabrication of Carbon Nanotube Reinforced Aluminum Composite by Powder Extrusion Process. *Mater. Sci. Forum* **534-536**, 889–897 (2007).
116. Lim, D. K. K., Shibayanagi, T. & Gerlich, a. P. P. Synthesis of multi-walled CNT reinforced aluminium alloy composite via friction stir processing. *Mater. Sci. Eng.* **507**, 194–199 (2009).
117. Lahiri, D., Bakshi, S. R. R., Keshri, a. K. K., Liu, Y. & Agarwal, A. Dual strengthening mechanisms induced by carbon nanotubes in roll bonded aluminum composites. *Mater. Sci. Eng. A* **52**, 263–270 (2009).
118. He, C. N., Zhao, N. Q., Shi, C. S. & Song, S. Z. Mechanical properties and microstructures of carbon nanotube-reinforced Al matrix composite fabricated by in situ chemical vapor deposition. *J. Alloys Compd.* **487**, 258–262 (2009).
119. Fauchais, P. Understanding plasma spraying. *J. Physics-D* **37**, 86–108 (2004).
120. Bakshi, S. R. *et al.* Carbon nanotube reinforced aluminum composite coating via cold spraying. *Surf. Coatings Technol.* **202**, 5162–5169 (2008).
121. He, C. *et al.* An approach to obtaining homogeneously dispersed carbon nanotubes in Al powders for preparing reinforced Al-matrix composites. *Adv. Mater.* **19**, 1128–1132 (2007).
122. Kwon, H., Park, D. H., Silvain, J. F. & Kawasaki, A. Investigation of carbon nanotube reinforced aluminum matrix composite materials. *Compos. Sci. Technol.* **70**, 546–550 (2010).
123. Srinivasa, R. B. *et al.* Carbon nanotube reinforced aluminum composite coating via cold spraying. *Surf. Coat. Technol.* **202**, 5162–5169 (2008).
124. Kicheol, K., Gyuyeol, B., Byungdoo, K. & Changhee, L. Electrical and mechanical properties of multi-walled carbon nanotube reinforced Al

- composite coatings fabricated by high velocity oxygen fuel spraying. *Surf. Coatings Technol.* **206**, 25, 4060–4067. (2012).
125. Dujardin, E., Ebbesen, T. W., Hiura, H. & Tanigaki, K. Capillarity and wetting of carbon nanotubes. *Science (80-.)*. **265**, 1850–1852 (1994).
  126. Bruce, D., Richard, M., Doug, L. & Musgrove, M. T. R. *Techniques for characterizing the wetting, coating and spreading of adhesives on surfaces. NPL report DEPC MPR 020* **3**, (2005).
  127. Li, S., Song, S., Yu, T., Chen, H. & Zhang, Y. Microstructure and fracture surfaces of carbon nanotubes/magnesium matrix composite. *Mater. Sci. Forum* **488–489**, 893–896 (2005).
  128. Goh, C. S., Wei, J., Lee, L. C. & Gupta, M. Simultaneous enhancement in strength and ductility by reinforcing magnesium with carbon nanotubes. *Mater. Sci. Eng.* **423**, 153–156 (2006).
  129. Goh, C. S., Wei, J., Lee, L. C. & Gupta, M. Ductility improvement and fatigue studies in Mg-CNT nanocomposites. *Compos. Sci. Technol.* **68**, 1432–1439 (2008).
  130. Bian, Z., Wang, R. J., Wang, W. H., Zhang, T. & Inoue, A. Carbon nanotube-reinforced Zr-based bulk metallic glass composites and their properties. *Adv. Funct. Mater.* **14**, 55–63 (2004).
  131. Li, Y. B., Ya, Q., Wei, B. Q., Liang, J. & H, W. D. Processing of a carbon nanotubes-Fe82P18 metallic glass composite. *J. Mater. Sci. Lett.* **17**, 607–609 (1998).
  132. Zhou, S. M. *et al.* Fabrication and tribological properties of carbon nanotubes reinforced Al composites prepared by pressureless infiltration technique. *Composites-A* **38**, 301–306 (2007).
  133. Garcia-Cordovilla, C., Louis, E. & Narciso, J. Pressure infiltration of packed ceramic particulates by liquid metals. *Acta Mater.* **18**, 4461–4479 (1999).
  134. Yang, J. & Schaller, R. Mechanical spectroscopy of Mg reinforced with Al<sub>2</sub>O<sub>3</sub> short fibers and C nanotubes. *Mater. Sci. Eng. A* **370**, 512–515 (2004).
  135. Uozumi, H. *et al.* Fabrication process of carbon nanotube/light metal matrix composites by squeeze casting. *Mater. Sci. Eng.* **495**, 282–287 (2008).
  136. Cho, G. S., Lim, J. K., Choe, K. H. & Lee, W. Ni nanoparticles deposition onto CNTs by electroless plating. *Mater. Sci. Forum* **658**, 360–363 (2010).
  137. Chen, P., Wu, X., Lin, J. & Tan, K. L. Synthesis of Cu nanoparticles and microsized fibers by using carbon nanotubes as templates. *J. Chem. Phys.* **103**, 4559–4561 (1999).

138. So, K. P. *et al.* SiC formation on carbon nanotube surface for improving wettability with aluminum. *Compos. Sci. Technol.* **74**, 6–13 (2013).
139. Sehyun, K. *et al.* Manufacture of CNTs-Al Powder Precursors for Casting of CNTs-Al Matrix Composites. *Mater. Sci. Forum* **765**, 353–357 (2013).
140. Qianqian, L., Viereckl, A., Rottmair, C. A. & Singer, R. F. Improved processing of carbon nanotube/magnesium alloy composites. *Compos. Sci. Technol.* **69**, 1193–1199 (2009).
141. Zeng, X. *et al.* A new technique for dispersion of carbon nanotube in a metal melt. *Mater. Sci. Eng. A* **527**, 5335–5340 (2010).
142. Abbasipour, B., Niroumand, B., Monir Vaghefi, S. M. & Vaghefi, S. M. M. Compocasting of A356-CNT composite. *Trans. Nonferrous Met. Soc. China* **20**, 1561–1566 (2010).
143. Rashad, R. M., Awadallah, O. M. & Wifi, A. S. Effect of MWCNTs content on the characteristics of A356 nanocomposite. *J Achie. Mat. Manuf. Eng.* **58**, 74–80 (2013).
144. Suslick, S. *et al.* Acoustic cavitation and its chemical consequences. *Philos. Trans. R. Soc.* **357**, 335–353 (1999).
145. Donthamsetty, S., Damera, N. R. & Jain, P. K. Ultrasonic Cavitation Assisted Fabrication and Characterization of A356 Metal Matrix Nanocomposite Reinforced with Sic, B4C, CNTs'. *AIJSTPME* **2**, 27–34 (2009).
146. Abdulkabir, R. A Comparative Analysis of Grain Size and Mechanical Properties of Al-Si Alloy Components Produced by Different Casting Methods'. *Assumpt. Univ. J. Technol.* **13**, 158–164 (2010).
147. Abou Bakr, H. *et al.* Microstructure and mechanical properties of MWCNTs reinforced A356 aluminum alloys cast nanocomposites Fabricated by using a combination of rheocasting and squeeze casting techniques. *J. Nanomater.* **1**, in press (2014).
148. Singh, C., Shaffer, M. S. P., Koziol, K. K. K. & Kinloch, I. A. Windle AH. Towards the production of large-scale aligned carbon nanotubes. *Chem. Phys. Lett.* **372**, 860–865 (2003).
149. Kumar, M. & Ando, Y. A simple method of producing aligned carbon nanotubes from an unconventional precursor – Camphor. *Chem. Phys. Lett.* **374**, 521–526 (2003).
150. Musso, S., Fanchini, G. & Tagliaferro, A. Growth of vertically aligned carbon nanotubes by CVD by evaporation of carbon precursors. *Diam. Relat. Mater.* **14**, 784–789 (2005).

151. Dassios, K. G., Musso, S. & Galiotis, C. Compressive behavior of MWCNT/epoxy composite mats. *Compos. Sci. Technol.* **72**, 1027–1033 (2012).
152. Kouravelou, K. B. & Sotirchos, S. V. Dynamic study of carbon nanotubes by chemical vapor deposition of alcohol- Review. *Adv. Mater. Sci.* **10**, 243–248 (2005).
153. Xiang, R., Einarsson, E., Okawa, J., Miyauchi, Y. & Maruyama, S. Acetylene-accelerated alcohol catalytic chemical vapor deposition growth of vertically aligned single-walled carbon nanotubes. *J. Phys. Chem.* **113**, 7511–7515 (2009).
154. Ren, Y. *et al.* Carbon nanotube film synthesized from ethanol and its oxidation behavior in air. *Chinese Phys. B* **21**, 098103 (2012).
155. Jaime, G. *et al.* Production Of Carbon Nanotubes and Hydrogen by Catalytic Ethanol Decomposition. *Dyna, year 80* **178**, 78–85 (2013).
156. Brockner, W., Ehrhardt, C. & Gjikaj, M. Thermal decomposition of nickel nitrate hexahydrate,  $\text{Ni}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$ , in comparison to  $\text{Co}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$  and  $\text{Ca}(\text{NO}_3)_2 \cdot 4\text{H}_2\text{O}$ . *ThermochimicaActa*. **456**, 64–71 (2007).
157. William Kennedy, M. Magnetic Fields and Induced Power in the Induction Heating of Aluminium Billets. (Royal Institute of Technology SE-100 44 Stockholm Sweden, 2013).
158. Vaughan, J. T. & Williamson, J. Design of induction-heating coils for cylindrical nonmagnetic loads. *IEEE* **64**, 587 – 592 (1945).
159. Walter, J. & Ceglia, G. *Using Numerical Methods to Design and Control Heating Induction Systems*. (2011).
160. Mansoor, M. & Shahid, M. On the design, thermal efficiency and stirring force of a coreless induction coil for fabrication of aluminum based nanocomposites. *J. Metall.* in press (2015).
161. Reddy, K. R. *et al.* A new one-step synthesis method for coating multi-walled carbon nanotubes with cuprous oxide nanoparticles. *Scr. Mater.* **58**, 1010–1013 (2008).
162. Sehyun, K. *et al.* Manufacture of CNTs-Al Powder Precursors for Casting of CNTs-Al Matrix Composites. *Mater. Sci. Forum* **765**, 353–357 (2013).
163. Omidvar, H., Mirzaei2, F. K., Rahimi1, M. H. & Sadeghian, Z. A method for coating carbon nanotubes with titanium. *NEW CARBON Mater.* **27**, 102–111 (2012).
164. Zhao, L. P. & Gao, L. Coating of multi walled carbon nanotubes with thick layers of tin (IV) oxide. *Carbon N. Y.* **42**, 1858–1867 (2004).

165. Wang, F., Arai, S. & Endo, M. The preparation of multi-walled carbon nanotubes with a Ni–P coating by an electroless deposition process. *Carbon N. Y.* **43**, 1716–1721 (2005).
166. Arai, S., Kobayashi, M., Yamamoto, T. & Endo, M. Pure-Nickel-Coated Multiwalled Carbon Nanotubes Prepared by Electroless Deposition. *Electrochim. Solid-State Lett.* **13**, D94 (2010).
167. Arai, S., Suzuki, Y., Nakagawa, J., Yamamoto, T. & Endo, M. Fabrication of metal coated carbon nanotubes by electroless deposition for improved wettability with molten aluminum. *Surf. Coatings Technol.* **212**, 207–213 (2012).
168. Maqbool, A. *et al.* Mechanical characterization of copper coated carbon nanotubes reinforced aluminum matrix composites. *Mater. Charact.* **86**, 39–48 (2013).
169. Baumli, P., Sytchev, J. & Kaptay, G. Perfect wettability of carbon by liquid aluminum achieved by a multifunctional flux. *J. Mater. Sci.* **45**, 5177–5190 (2010).
170. Juhasz, K. L., Baumli, P., Sytchev, J. & Kaptay, G. Wettability of graphite by liquid aluminum under molten potassium halide fluxes. *J. Mater. Sci.* **48**, 7679–7685 (2013).
171. Juhasz, K. L., Baumli, P. & Kaptay, G. Fabrication of carbon fibre reinforced, aluminium matrix composite by potassium iodide (KI) - potassium hexafluoro-titanate (K<sub>2</sub>TiF<sub>6</sub>) flux. *Materwiss. Werksttech.* **43**, 310–314 (2012).
172. Muratore, C. *et al.* Nanoparticle decoration of carbon nanotubes by sputtering. *Carbon N. Y.* **57**, 274–281 (2013).
173. Kim, C. *et al.* Strengthening of copper matrix composites by nickel-coated single-walled carbon nanotube reinforcements. *Sympthetic Met.* **159**, 424–429 (2009).
174. Baumli, P., Sytchev, J., Kaptay, G. & Kaptay, P. B. J. S. G. Perfect wettability of carbon by liquid aluminum achieved by a multifunctional flux. *J. Mater. Sci.* **45**, 5177–5190 (2010).
175. Iida, T. & Guthrie, R. *The physical properties of liquid metals*. (Clarendon Press, 1993).
176. DANĚK, V. & ŠIŠKA, J. MATIAŠOVSKÝ, K. Volume properties of the melts of the system KF—KCl—K<sub>2</sub>TiF<sub>6</sub>. *Chem. Pap.* **42**, 753–761 (1988).
177. Mansoor, M. & Shahid, M. Optimization of ethanol flow rate for improved catalytic activity of Ni particles to synthesize MWCNTs using a CVD reactor. *Ibro-Amer J. Mater. Res.* **17(3)**, 739–746 (2014).

178. Jeong, H. J. *et al.* High-Yield Catalytic Synthesis of Thin Multiwalled Carbon Nanotubes. *J. Phys. Chem. B* **108**, 17695–17698 (2004).
179. FOSECO. Melt Treatment of Aluminium and Aluminium alloys. <http://www.foseco.com/en-gb/end-markets/foundry/reference-centre/download-service/wallcharts/> (2012). at <<http://www.foseco.com/en-gb/end-markets/foundry/reference-centre/download-service/wallcharts/>>
180. Majidi, O., Shabestari, S. G. & Aboutalebi, M. R. Study of fluxing temperature in molten aluminum refining process. *J. Mater. Process. Technol.* **182**, 450–455 (2007).
181. Shih, T.-S. & Wen, K.-Y. Effects of Degassing and Fluxing on the Quality of Al-7%Si and A356.2 Alloys. *Mater. Trans.* **46**, 263–271 (2005).
182. Suryanarayana, C. & Norton Grant, M. *X-ray Diffraction: A Paractical Approach*. (Springer Science+Business Media, LLC, 1998). doi:10.1007/978-1-4899-0148-4
183. Li, Y. H. *et al.* Adsorption of florid from water by amorphous alumina supported on carbon nanotubes. *Chem. Phys. Lett.* **350**, 412–415 (2001).
184. Buang, N. A., Fadil, F., Majid, Z. A. & Shahir, S. Characteristic of mild acid functionalized multiwalled carbon nanotubes towards high dispersion with low structural defects. *Dig. J. Nanomater. Biostructures* **7**, 33–39 (2012).
185. Shin-ichi, H. *et al.* Transformation of multiwalled carbon nanotubes to amorphous carbon nanorods under ion irradiation. *Japanese J. Appl. Phys.* **53**, 2DB061. (2014).
186. Scheibe, B., Borowiak-Palen, E. & Kalenczuk, R. J. Oxidation and reduction of multiwalled carbon nanotubes -preparation and characterization. *Mater. Charact.* **61**, 185–191 (2010).
187. Shaffer, M. S. P. & H, W. A. Fabrication and Characterization of Carbon Nanotube/Poly(vinyl alcohol) Composites. *Adv. Mater.* **11**, 937–941 (1999).
188. Konstantinos, G. & Dassios, C. G. Polymer–nanotube interaction in MWCNT/ poly(vinyl alcohol) composite mats. *Carbon N. Y.* **50**, 4291–4301 (2012).
189. Lehman, J. H., Terrones, M., Mansfield, E., Hurst, K. E. & Meunier, V. Evaluating the characteristics of multiwall carbon nanotubes. *Carbon N. Y.* **49**, 2581–2602 (2011).
190. Shi, Z. *et al.* Large scale synthesis of single-wall carbon nanotubes by arc-discharge method. *J. Phys. Chem. Solids* **61**, 1031–1036 (2000).

191. Dung, N. D. *et al.* Carbon-nanotube growth over iron nanoparticles formed on CaCO<sub>3</sub> support by using hydrogen reduction. *J. Korean Phys. Soc.* **52**, 1372–1377 (2008).
192. Saito, R. *et al.* Double resonance Raman spectroscopy of single-wall carbon nanotubes. *New J. Phys.* **5**, 157.1–15 (2003).
193. Dileo, R. A., Landi, B. J. & Raffaele, R. P. Purity assessment of multiwalled carbon nanotubes by Raman spectroscopy. *J. Appl. Phys.* **101**, 0643071–0643075 (2007).
194. Aleksandrov, Y. A., Tsyganova, E. I. & Pisarev, A. L. Reaction of aluminum with dilute aqueous NaOH solutions. *Russ. J. Gen. Chem.* **73**, 689–694 (2003).
195. Barbara Dutrow, L Christine Clark, M. X-ray Powder Diffraction (XRD). [http://serc.carleton.edu/research\\_education/geochemsheets/techniques/XRD.html](http://serc.carleton.edu/research_education/geochemsheets/techniques/XRD.html) as viewed on 8 July, 2014
196. Nam, D. H. *et al.* Synergistic strengthening by load transfer mechanism and grain refinement of CNT/Al–Cu composites. *Carbon N. Y.* **50**, 2417–2423 (2012).
197. George, R., Kashyap, K. T., Rahul, R. & Yamdagni, S. Strengthening in carbon nanotube/aluminium (CNT/Al) composites. *Scr. Mater.* **53**, 1159–1163 (2005).
198. Ruoff, R. S., Qian, D. & Liu, W. K. Mechanical properties of carbon nanotubes: theoretical predictions and experimental measurements. *Comptes Rendus Phys.* **4**, 993–1008 (2003).
199. Dieter, G. E. *Mechanical Metallurgy*. (McGraw-Hills, 1988).
200. Birol, Y. In situ synthesis of Al–TiCp composites by reacting K<sub>2</sub>TiF<sub>6</sub> and particulate graphite in molten aluminium. *J. Alloys Compd.* **454**, 110–117 (2008).
201. Taylor, H., Flemings, M. & Wulff, J. *Foundry Engineerin*. (John Wiley & Sons, 1993).
202. Birol, Y. Analysis of the response to thermal exposure of Al/K<sub>2</sub>TiF<sub>6</sub> powder blends. *J. Alloys Compd.* **478**, 265–268 (2009).
203. Stefanescu, D. *Science and Engineering of Casting Solidification Second Edition*. (Springer, 2008).
204. Aluminum 1199, A. <http://www.azom.com/article.aspx?ArticleID=8699>. 1–2 at <<http://www.azom.com/article.aspx?ArticleID=8699>>

205. Abbasi Chianeh, V., Madaah Hosseini, H. R. & Nofar, M. Micro structural features and mechanical properties of Al-Al<sub>3</sub>Ti composite fabricated by in-situ powder metallurgy route. *J. Alloys Compd.* **473**, 127–132 (2009).
206. Choudhry, M. A. & Ashraf, M. Effect of heat treatment and stress relaxation in 7075 aluminum alloy. *J. Alloys Compd.* **437**, 113–116 (2007).
207. Butt, M. Z., Zubair, M. & Haq, I. U. A comparative study of the stress relaxation in aged and un-aged high-purity aluminium polycrystals. *J. Mater. Sci.* **5**, 6139–6144 (2000).
208. Kwon, H. *et al.* Investigation of carbon nanotube reinforced aluminum matrix composite materials. *Compos. Sci. Technol.* **70**, 546–550 (2010).
209. Tjong, S. C. Novel Nanoparticle-Reinforced Metal Matrix Composites with Enhanced Mechanical Properties. *Adv. Eng. Mater.* **9**, 639–652 (2007).
210. Clyne, T. W. *An introduction to metal matrix composites*. (Cambridge University Press, 1995).
211. Res, C., Butt, M. Z. & Feltham, P. Low-temperature anomalies in the plastic response of crystalline materials. *Cryst. Res. Technol.* **19**, 325–329 (1984).
212. Courtney, T. H. *Mechanical behavior of materials*. (McGraw-Hills, 2000).
213. Gao, C., Guo, Z., Liu, J.-H. & Huang, X.-J. The new age of carbon nanotubes: an updated review of functionalized carbon nanotubes in electrochemical sensors. *Nanoscale* **4**, 1948–63 (2012).
214. Bakshi, S. R. & Agarwal, A. An analysis of the factors affecting strengthening in carbon nanotube reinforced aluminum composites. *Carbon N. Y.* **49**, 533–544 (2011).
215. Rudnev, V. I., Loveless, D., Cook, R. & Black, N. *Handbook of Induction Heating*. (Marcel Dekker, 2003).
216. Yi, Z. & Ya, Z. *Induction and Microwave Heating of Mineral and Organic Materials, Advances in Induction and Microwave Heating of Mineral and Organic Materials*. (InTech, 2011). at <<http://www.intechopen.com/books/advances-in-induction-and-microwave-heating-of-mineral-and-organic-materials/magnetic-induction-heating-of-nano-sized-ferrite-particle>>
217. *Practical induction heat treating*, ASM, *Handbook*. (ASM International, 2001).
218. Rapoport, E. & Pleshivtseva, Y. *Optimal control of induction heating processes*. (CRC Taylor and Francis, 2007).

219. Bala, K. C. Design Analysis of an Electric Induction Furnace for Melting Aluminum Scrap. **9**, 83–88 (2005).