

REFERENCES

- [1] MacDiarmid, A.G. Nobel Lecture: "Synthetic metals": A novel role for organic polymers. *Reviews of Modern Physics*, 73(3):701, 2001.
- [2] Shirakawa, H., Louis, E.J., MacDiarmid, A.G., Chiang, C.K. and Heeger, A.J. Synthesis of electrically conducting organic polymers: halogen derivatives of polyacetylene, $(\text{CH})_x$, *Journal of the Chemical Society, Chemical Communications*, 16:578-580, 1977.
- [3] Xia, L., Wei, Z. and Wan, M. Conducting polymer nanostructures and their application in biosensors. *Journal of colloid and interface science*, 341(1):1-11, 2010.
- [4] Le, T. H., Kim, Y. and Yoon, H. Electrical and electrochemical properties of conducting polymers, *Polymers*, 9(4):150, 2017.
- [5] Letheby, H. On the Physiological Properties of Nitro-Benzole and Aniline. *The Boston Medical and Surgical Journal*, 69(16):313-320, 1863.
- [6] Mohilner, D.M., Adams, R. N. and Argersinger, W. J. Investigation of the kinetics and mechanism of the anodic oxidation of aniline in aqueous sulfuric acid solution at a platinum electrode, *Journal of the American Chemical Society*, 84(19):3618-3622, 1962.
- [7] Anft, B., Friedlieb Ferdinand Runge: A forgotten chemist of the nineteenth century, *Journal of Chemical Education*, 32(11):566, 1955.
- [8] Green, A. G. and Woodhead, A. E. CCXLIII.-Aniline-black and allied compounds. Part I, *Journal of the Chemical Society, Transactions*, 97:2388-2403, 1910.
- [9] Szarvasy, E. C. XVIII.-Electrolytic preparation of induline dyes, *Journal of the Chemical Society, Transactions*, 77:207-212, 1900.
- [10] Pintschovius, L., Polysulfur nitride, $(\text{SN})_x$, the first example of a polymeric metal, *Colloid and Polymer Science*, 256(9):883-892, 1978.
- [11] Rickert, S. E., Lando, J. B., Hopfinger, A. J. and Baer, E. Epitaxial Polymerization of $(\text{SN})_x$. 1. Structure and Morphology of Single Crystals on Alkali Halide Substrates, *Macromolecules*, 12(6):1053-1057, 1979.

References

- [12] Park, Y. W., Park, C., Lee, Y. S., Yoon, C. O., Shirakawa, H., Suezaki, Y. and Akagi, K. Electrical conductivity of highly-oriented-polyacetylene, *Solid state communications*, 65(2):147-150, 1988.
- [13] Tsukamoto, J., Recent advances in highly conductive polyacetylene, *Advances in Physics*, 41(6):509-546, 1992.
- [14] Diaz, A. F. Electrochemical Preparation and Characterization of Conducting Polymers, *Chemica Scripta*, 17:145:148, 1981.
- [15] Diaz, A. F. and Hall, B. Mechanical properties of electrochemically prepared polypyrrole films, *IBM Journal of Research and Development*, 27(4):342-347, 1983.
- [16] Molapo, K. M., Ndangili, P. M., Ajayi, R. F., Mbambisa, G., Mailu, S. M., Njomo, N., Masikini, M., Baker, P. and Iwuoha, E. I. Electronics of conjugated polymers (I): polyaniline, *International Journal of Electrochemical Science*, 7(12):11859-11875, 2012.
- [17] Bao, Z., Dodabalapur, A. and Lovinger, A. J. Soluble and processable regioregular poly (3-hexylthiophene) for thin film field-effect transistor applications with high mobility, *Applied Physics Letters*, 69(26):4108-4110, 1996.
- [18] Horowitz, G. Organic field-effect transistors, *Advanced materials*, 10(5):365-377, 1998.
- [19] Paloheimo, J., Kuivalainen, P., Stubb, H., Vuorimaa, E. and Yli-Lahti, P. Molecular field-effect transistors using conducting polymer Langmuir-Blodgett films, *Applied physics letters*, 56(12):1157-1159, 1990.
- [20] Frackowiak, E., Khomenko, V., Jurewicz, K., Lota, K. and Béguin, F. Supercapacitors based on conducting polymers/nanotubes composites, *Journal of Power Sources*, 153(2):413-418, 2006.
- [21] Snook, G. A., Kao, P. and Best, A. S. Conducting-polymer-based supercapacitor devices and electrodes, *Journal of Power Sources*, 196(1):1-12, 2011.
- [22] Wang, X., Zhi, L. and Müllen, K. Transparent, conductive graphene electrodes for dye-sensitized solar cells, *Nano letters*, 8(1):323-327, 2008.
- [23] Huynh, W. U., Dittmer, J. J. and Alivisatos, A. P. Hybrid nanorod-polymer solar cells, *Science*, 295(5564):2425-2427, 2002.
- [24] Ding, J., Zhou, D., Spinks, G., Wallace, G., Forsyth, S., Forsyth, M. and MacFarlane, D. Use of ionic liquids as electrolytes in electromechanical actuator

References

- systems based on inherently conducting polymers, *Chemistry of materials*, 15(12):2392-2398, 2003.
- [25] Kaneto, K., Kaneko, M., Min, Y. and MacDiarmid, A. G. "Artificial muscle": Electromechanical actuators using polyaniline films, *Synthetic Metals*, 71(1-3):2211-2212, 1995.
- [26] Hamed, M., Forchheimer, R. and Inganäs, O. Towards woven logic from organic electronic fibres, *Nature materials*, 6(5):357, 2007.
- [27] Lee, J., Kwon, H., Seo, J., Shin, S., Koo, J. H., Pang, C., Son, S., Kim, J. H., Jang, Y. H., Kim, D. E. and Lee, T. Conductive fiber-based ultrasensitive textile pressure sensor for wearable electronics, *Advanced materials*, 27(15):2433-2439, 2015.
- [28] Armelin, E., Oliver, R., Liesa, F., Iribarren, J. I., Estrany, F. and Alemán, C. Marine paint formulations: Conducting polymers as anticorrosive additives, *Progress in Organic Coatings*, 59(1):46-52, 2007.
- [29] Baldissera, A. F. and Ferreira, C. A. Coatings based on electronic conducting polymers for corrosion protection of metals, *Progress in Organic Coatings*, 75(3):241-247, 2012.
- [30] Heeger A. J., Nobel Lecture: Semiconducting and metallic polymers: The fourth generation of polymeric materials, *Reviews of Modern Physics*, 73 (3):681-700, 2001.
- [31] Skotheim, T. A. *Handbook of conducting polymers*, Merce Dekkar Inc. New York, USA, 2nd edition, 1997.
- [32] Gommans, H. H. P. *Charge transport and interface phenomena in semiconducting polymers*, Ph.D. Thesis, Eindhoven University of Technology, Netherlands, 2005.
- [33] MacDiarmid, A. G., Mammone, R. J., Kaner, R. B. and Porter, S. J. The concept of 'doping' of conducting polymers: the role of reduction potentials, *Philosophical Transactions of the Royal Society A*, 314(1528):3-15, 1985.
- [34] Chiang, C. K., Fincher Jr, C. R., Park, Y. W., Heeger, A. J., Shirakawa, H., Louis, E. J., Gau, S. C. and MacDiarmid, A. G. Electrical conductivity in doped polyacetylene, *Physical review letters*, 39(17):1098, 1977.
- [35] Chiang, C. K., Park, Y. W., Heeger, A. J., Shirakawa, H., Louis, E. J. and MacDiarmid, A. G. Conducting polymers: Halogen doped polyacetylene, *The Journal of Chemical Physics*, 69(11):5098-5104, 1978.

References

- [36] Kanatzidis, M. G., Polymeric Electrical Conductors, *Chemical & Engineering News*, 68:36-54, 1990.
- [37] Salaneck, W. R., Friend, R. H., and Brédas, J. L. Electronic structure of conjugated polymers: Consequences of electron-lattice coupling, *Physical Review*, 319(6):231-251, 1999.
- [38] Kertesz, M., Choi, C. H. and Yang, S., Conjugated polymers and aromaticity, *Chemical reviews*, 105(10):3448-3481, 2005.
- [39] Stafström, S. and Chao, K. Polaron-bipolaron-soliton doping in polyacetylene, *Physical Review B*, 30(4):2098, 1984.
- [40] Girlando, A., Painelli, A. and Soos, Z. G. Electron-phonon coupling in conjugated polymers: Reference force field and transferable coupling constants for polyacetylene, *The Journal of Chemical physics*, 98(9):7459-7465, 1993.
- [41] Heeger, A. J., Kivelson, S., Schrieffer, J. R. and Su, W. P. Solitons in conducting polymers, *Reviews of Modern Physics*, 60(3):781, 1988.
- [42] Mizes, H. A. and Conwell, E. M. Stability of polarons in conducting polymers, *Physical Review Letters*, 70(10):1505, 1993.
- [43] Bredas, J. L. and Street, G. B. Polarons, bipolarons, and solitons in conducting polymers, *Accounts of Chemical Research*, 18(10):309-315, 1985.
- [44] Scott, J. C., Pfluger, P., Krounbi, M. T. and Street, G. B. Electron-spin-resonance studies of pyrrole polymers: evidence for bipolarons, *Physical Review B*, 28(4):2140, 1983.
- [45] Huang, W. S., Humphrey, B. D. and MacDiarmid, A. G., Polyaniline, a novel conducting polymer. Morphology and chemistry of its oxidation and reduction in aqueous electrolytes, *Journal of the Chemical Society, Faraday Transactions 1: Physical Chemistry in Condensed Phases*, 82(8):2385-2400, 1986.
- [46] Zhang, X. and Manohar, S. K. Polyaniline nanofibers: chemical synthesis using surfactants, *Chemical Communications*, (20):2360-2361, 2004.
- [47] Wei, Y., Focke, W. W., Wnek, G. E., Ray, A. and MacDiarmid, A. G. Synthesis and electrochemistry of alkyl ring-substituted polyanilines, *The Journal of Physical Chemistry*, 93(1):495-499, 1989.
- [48] Delvaux, M., Duchet, J., Stavaux, P.Y., Legras, R. and Demoustier-Champagne, S. Chemical and electrochemical synthesis of polyaniline micro-and nano-tubules, *Synthetic Metals*, 113(3):275-280, 2000.

References

- [49] Ansari, R. and Keivani, M. B. Polyaniline conducting electroactive polymers thermal and environmental stability studies, *Journal of Chemistry*, 3(4):202-217, 2006.
- [50] Genies, E. M., Syed, A. A. and Tsintavis, C. Electrochemical Study Of Polyaniline In Aqueous And Organic Medium. Redox And Kinetic Properties. *Molecular Crystals and Liquid Crystals*, 121(1-4):181-186, 1985.
- [51] Valentová, H. and Stejskal, J. Mechanical properties of polyaniline, *Synthetic Metals*, 160(7-8):832-834, 2010.
- [52] Li, J., Fang, K., Qiu, H., Li, S. and Mao, W. Micromorphology and electrical property of the HCl-doped and DBSA-doped polyanilines, *Synthetic metals*, 142(1-3):107-111, 2004.
- [53] MacDiarmid, A. G., Chiang, J. C., Richter, A. F. and Epstein, A. A. Polyaniline: a new concept in conducting polymers, *Synthetic Metals*, 18(1-3):285-290, 1987.
- [54] Masters, J. G., Sun, Y., MacDiarmid, A. G. and Epstein, A. J. Polyaniline: allowed oxidation states, *Synthetic Metals*, 41(1-2):715-718, 1991.
- [55] Kang, E. T., Neoh, K. G. and Tan, K. L. Polyaniline: a polymer with many interesting intrinsic redox states, *Progress in Polymer Science*, 23(2):277-324, 1998.
- [56] Burroughes, J. H., Bradley, D. D. C., Brown, A. R., Marks, R. N., Mackay, K., Friend, R. H., Burns, P. L. and Holmes, A. B. Light-emitting diodes based on conjugated polymers, *Nature*, 347(6293):539, 1990.
- [57] Braun, D. and Heeger, A. J. Visible light emission from semiconducting polymer diodes, *Applied Physics Letters*, 58(18):1982-1984, 1991.
- [58] Kraft, A., Grimsdale, A. C. and Holmes, A. B. Electroluminescent conjugated polymers—seeing polymers in a new light, *Angewandte Chemie International Edition*, 37:402-428, 1998.
- [59] Wessling, R. A., Zimmermann, R. G. US. Patent 3401152, 1968.
- [60] Wessling, R. A.; Zimmerman, R. G. U.S. Patent 3532643, 1970.
- [61] Neef, C. J. and Ferraris, J. P. MEH-PPV: improved synthetic procedure and molecular weight control, *Macromolecules*, 33(7):2311-2314, 2000.
- [62] Doi, S., Kuwabara, M., Noguchi, T. and Ohnishi, T. Organic electroluminescent devices having poly (dialkoxy-p-phenylene vinylenes) as a light emitting material, *Synthetic Metals*, 57(1):4174-4179, 1993.

References

- [63] Wudl, F., Allemand, P. M., Srdanov, G., Ni, Z. and McBranch, D. Polymers and an Unusual Molecular Crystal with Nonlinear Optical Properties, *ACS Symposium Series*, 455:683, 1991.
- [64] Egbe, D. A., Neugebauer, H. and Sariciftci, N. S. Alkoxy-substituted poly (arylene-ethynylene)-alt-poly (arylene-vinylene) s: synthesis, electroluminescence and photovoltaic applications, *Journal of Materials Chemistry*, 21(5):1338-1349, 2011.
- [65] Gustafsson, G., Cao, Y., Treacy, G. M., Klavetter, F., Colaneri, N. and Heeger, A. J. Flexible light-emitting diodes made from soluble conducting polymers, *Nature*, 357(6378):477, 1992.
- [66] Sarnecki, G. J., Burn, P. L., Kraft, A., Friend, R. H. and Holmes, A. B. The synthesis and characterisation of some poly (2, 5-dialkoxy-1, 4-phenylene vinylene) s, *Synthetic metals*, 55(2-3):914-917, 1993.
- [67] Breeze, A. J., Schlesinger, Z., Carter, S. A. and Brock, P. J. Charge transport in TiO₂/MEH-PPV polymer photovoltaics, *Physical Review B*, 64(12):125205, 2001.
- [68] Sariciftci, N. S., Braun, D., Zhang, C., Srdanov, V. I., Heeger, A. J., Stucky, G. and Wudl, F. Semiconducting polymer-buckminsterfullerene heterojunctions: Diodes, photodiodes, and photovoltaic cells, *Applied Physics Letters*, 62(6):585-587, 1993.
- [69] Thompson, B. C., Kim, Y. G. and Reynolds, J. R. Spectral broadening in MEH-PPV: PCBM-based photovoltaic devices via blending with a narrow band gap cyanovinylene-dioxythiophene polymer, *Macromolecules*, 38(13):5359-5362, 2005.
- [70] Pei, Q., Yu, G., Zhang, C., Yang, Y. and Heeger, A. J. Polymer light-emitting electrochemical cells, *Science*, 269(5227):1086-1088, 1995.
- [71] Li, Y., Cao, Y., Gao, J., Wang, D., Yu, G. and Heeger, A. J. Electrochemical properties of luminescent polymers and polymer light-emitting electrochemical cells, *Synthetic Metals*, 99(3):243-248, 1999.
- [72] Yang, Y. and Pei, Q. Voltage controlled two color light-emitting electrochemical cells, *Applied Physics Letters*, 68(19):2708-2710, 1996.
- [73] Matharu, Z., Arya, S. K., Singh, S. P., Gupta, V. and Malhotra, B. D. Langmuir-Blodgett film based on MEH-PPV for cholesterol biosensor, *Analytica Chimica Acta*, 634(2):243-249, 2009.

References

- [74] Hsieh, B. R., Yu, Y., VanLaeken, A. C. and Lee, H. General methodology toward soluble poly (p-phenylenevinylene) derivatives, *Macromolecules*, 30(25):8094-8095, 1997.
- [75] Yang, Z., Hu, B. and Karasz, F. E. Polymer electroluminescence using ac or reverse dc biasing, *Macromolecules*, 28(18):6151-6154, 1995.
- [76] Leung, L. M. and Chik, G. L. Phase-transfer catalysed synthesis of disubstituted poly (phenylene vinylene), *Polymer*, 34(24):5174-5179, 1993.
- [77] Jung, S. H., Kim, H. K., Kim, S. H., Kim, Y. H., Jeoung, S. C. and Kim, D. Palladium-catalyzed direct synthesis, photophysical properties, and tunable electroluminescence of novel silicon-based alternating copolymers, *Macromolecules*, 33(25):9277-9288, 2000.
- [78] Miyaura, N. and Suzuki, A. Palladium-catalyzed cross-coupling reactions of organoboron compounds, *Chemical reviews*, 95(7):2457-2483, 1995.
- [79] Gilch, H. G. and Wheelwright, W. L. Polymerization of α -halogenated p-xylenes with base, *Journal of Polymer Science Part A: Polymer Chemistry*, 4(6):1337-1349, 1966.
- [80] Wu, X., Shi, G., Chen, F. E., Han, S. and Peng, J. High-quality poly [2-methoxy-5-(2'-ethylhexyloxy)-p-phenylenevinylene] synthesized by a solid-liquid two-phase reaction: Characterizations and electroluminescence properties, *Journal of Polymer Science Part A: Polymer Chemistry*, 42(12):3049-3054, 2004.
- [81] Sakiyama, S., Mizutani, N. and Fujita, K. September. p-Type and n-Type Doping for Polymer Semiconductor, *In Meeting Abstracts, The Electrochemical Society*, 42:3155-3155, 2016.
- [82] Sakiyama, S., Komura, T., Iwashita, H., Mizutani, N. and Fujita, K. Carrier Density and Mobility in n-Doped Poly (p-Phenylene Vinylene), *Evergreen: Joint Journal of Novel Carbon Resource Sciences & Green Asia Strategy*, 3(1):18-20, 2016.
- [83] Sakiyama, S., Mizutani, N. and Fujita, K. Controllable p-and n-type doping of poly [2-methoxy-5-(2'-methyl-hexyloxy)-p-phenylenevinylene] films prepared by evaporative spray deposition using ultradilute solution, *Japanese Journal of Applied Physics*, 55(4S):04EL03, 2016.

References

- [84] Matharu, Z., Arya, S. K., Singh, S. P., Gupta, V. and Malhotra, B. D. Langmuir-Blodgett film based on MEH-PPV for cholesterol biosensor, *Analytica chimica acta*, 634(2):243-249, 2009.
- [85] Vacanti, J. P. and Langer, R. Tissue engineering: the design and fabrication of living replacement devices for surgical reconstruction and transplantation, *The Lancet*, 354:S32-S34, 1999.
- [86] Olson, J. L., Atala, A. and Yoo, J. J. Tissue engineering: current strategies and future directions, *Chonnam medical journal*, 47(1):1-13, 2011.
- [87] Howard, D., Buttery, L. D., Shakesheff, K. M. and Roberts, S. J. Tissue engineering: strategies, stem cells and scaffolds, *Journal of anatomy*, 213(1):66-72, 2008.
- [88] Meyer, U. *Fundamentals of tissue engineering and regenerative medicine*. Springer, Berlin, Germany, 2009. DOI: <https://doi.org/10.1007/978-3-540-77755-7>
- [89] Ratner, B. D. *Biomaterials science: An introduction to materials in medicine*. Elsevier Academic Press, Amsterdam, Boston, 2004.
- [90] Stock, U.A. and Vacanti, J. P. Tissue engineering: current state and prospects, *Annual review of medicine*, 52(1):443-451, 2001.
- [91] Vert, M., Doi, Y., Hellwich, K. H., Hess, M., Hodge, P., Kubisa, P., Rinaudo, M. and Schué, F. Terminology for biorelated polymers and applications (IUPAC Recommendations 2012), *Pure and Applied Chemistry*, 84(2):377-410, 2012.
- [92] Yang, S., Leong, K. F., Du, Z. and Chua, C. K. The design of scaffolds for use in tissue engineering. Part I. Traditional factors, *Tissue Engineering*, 7(6):679-689, 2001.
- [93] Ravichandran, R., Sundarajan, S., Venugopal, J. R., Mukherjee, S. and Ramakrishna, S. Advances in polymeric systems for tissue engineering and biomedical applications, *Macromolecular Bioscience*, 12(3):286-311, 2012.
- [94] Ratner, B. D., Hoffman, A. S., Schoen, F. J., Lemons, J. E. *Introduction-Biomaterials Science: An Evolving, Multidisciplinary Endeavor*. Academic Press, 3rd edition.
- [95] Narayan, R. J. The next generation of biomaterial development, *Philosophical Transactions of the Royal Society A*, 368:1831-1837, 2010.
- [96] Hench, L. L. and Thompson, I. Twenty-first century challenges for biomaterials, *Journal of the Royal Society Interface*, 7(Suppl 4):S379-S391, 2010.

References

- [97] Kaur, G., Pandey, O. P., Singh, K., Homa, D., Scott, B. and Pickrell, G. A review of bioactive glasses: their structure, properties, fabrication and apatite formation, *Journal of Biomedical Materials Research Part A*, 102(1):254-274, 2014.
- [98] Daemen, J. and Serruys, P. W. Drug-eluting stent update 2007: part II: unsettled issues, *Circulation*, 116(8):961-968, 2007.
- [99] Hench, L. L. and Polak, J. M. Third-generation biomedical materials, *Science*, 295(5557):1014-1017, 2002.
- [100] Moroni, L., De Wijn, J. R. and Van Blitterswijk, C. A. Integrating novel technologies to fabricate smart scaffolds, *Journal of Biomaterials Science, Polymer Edition*, 19(5):543-572, 2008.
- [101] Chai, C. and Leong, K. W. Biomaterials approach to expand and direct differentiation of stem cells, *Molecular therapy*, 15(3):467-480, 2007.
- [102] Place, E. S., Evans, N. D. and Stevens, M. M. Complexity in biomaterials for tissue engineering, *Nature materials*, 8(6):457, 2009.
- [103] Wu, M., He, J., Ren, X., Cai, W. S., Fang, Y. C. and Feng, X. Z. Development of functional biointerfaces by surface modification of polydimethylsiloxane with bioactive chlorogenic acid, *Colloids and Surfaces B: Biointerfaces*, 116:700-706, 2014.
- [104] Chen, G., Ushida, T. and Tateishi, T. Scaffold design for tissue engineering, *Macromolecular Bioscience*, 2(2):67-77, 2002.
- [105] Davis, J. R. *Handbook of materials for medical devices*. OH: ASM International, Materials Park, 2003.
- [106] Wallace, G.G., Teasdale, P.R., Spinks, G.M. and Kane-Maguire, L.A. *Conductive electroactive polymers: intelligent materials systems*. CRC press, Taylor & Francis, 2nd edition, 2002.
- [107] Janoschka, T., Hager, M. D. and Schubert, U. S. Powering up the future: radical polymers for battery applications, *Advanced Materials*, 24(48):6397-6409, 2012.
- [108] Croce, F., Appetecchi, G. B., Persi, L. and Scrosati, B. Nanocomposite polymer electrolytes for lithium batteries, *Nature*, 394(6692):456, 1998.
- [109] Ago, H., Petritsch, K., Shaffer, M. S., Windle, A. H. and Friend, R. H. Composites of carbon nanotubes and conjugated polymers for photovoltaic devices, *Advanced Materials*, 11(15):1281-1285, 1999.
- [110] Kymakis, E. and Amaratunga, G. A. J. Single-wall carbon nanotube/conjugated polymer photovoltaic devices, *Applied Physics Letters*, 80(1):112-114, 2002.

References

- [111]Zhang, D., Ryu, K., Liu, X., Polikarpov, E., Ly, J., Tompson, M. E. and Zhou, C. Transparent, conductive, and flexible carbon nanotube films and their application in organic light-emitting diodes, *Nano Letters*, 6(9):1880-1886, 2006.
- [112]Mortimer, R. J., Dyer, A. L. and Reynolds, J. R. Electrochromic organic and polymeric materials for display applications, *Displays*, 27(1):2-18, 2006.
- [113]Pei, Q., Zuccarello, G., Ahlskog, M. and Inganäs, O. Electrochromic and highly stable poly(3, 4-ethylenedioxythiophene) switches between opaque blue-black and transparent sky blue, *Polymer*, 35(7):1347-1351, 1994.
- [114]Jakubiec, B., Marois, Y., Zhang, Z., Roy, R., Sigot-Luizard, M.F., Dugré, F.J., King, M.W., Dao, L., Laroche, G. and Guidoin, R. In vitro cellular response to polypyrrole-coated woven polyester fabrics: Potential benefits of electrical conductivity, *Journal of Biomedical Materials Research Part A*, 41(4):519-526, 1998.
- [115]Wang, Z., Roberge, C., Dao, L. H., Wan, Y., Shi, G., Rouabhia, M., Guidoin, R. and Zhang, Z. In vivo evaluation of a novel electrically conductive polypyrrole/poly (D, L-lactide) composite and polypyrrole-coated poly (D, L-lactide-co-glycolide) membranes, *Journal of Biomedical Materials Research Part A*, 70(1):28-38, 2004.
- [116]Wang, Z., Roberge, C., Wan, Y., Dao, L. H., Guidoin, R. and Zhang, Z. A biodegradable electrical bioconductor made of polypyrrole nanoparticle/poly (D, L-lactide) composite: A preliminary in vitro biostability study, *Journal of Biomedical Materials Research Part A*, 66(4):738-746, 2003.
- [117]Hardy, J. G., Mouser, D. J., Arroyo-Currás, N., Geissler, S., Chow, J. K., Nguy, L., Kim, J. M. and Schmidt, C. E. Biodegradable electroactive polymers for electrochemically-triggered drug delivery, *Journal of Materials Chemistry B*, 2(39):6809-6822, 2014.
- [118]Hardy, J. G., Lee, J. Y. and Schmidt, C. E. Biomimetic conducting polymer-based tissue scaffolds, *Current opinion in biotechnology*, 24(5):847-854, 2013.
- [119]Hardy, J. G., Sukhvasi, R. C., Aguilar, D., Villancio-Wolter, M. K., Mouser, D. J., Geissler, S. A., Nguy, L., Chow, J. K., Kaplan, D. L. and Schmidt, C. E. Electrical stimulation of human mesenchymal stem cells on biom mineralized conducting polymers enhances their differentiation towards osteogenic outcomes, *Journal of Materials Chemistry B*, 3(41):8059-8064, 2015.

References

- [120]Ghasemi-Mobarakeh, L., Prabhakaran, M. P., Morshed, M., Nasr-Esfahani, M. H., Baharvand, H., Kiani, S., Al-Deyab, S. S. and Ramakrishna, S. Application of conductive polymers, scaffolds and electrical stimulation for nerve tissue engineering, *Journal of Tissue Engineering and Regenerative Medicine*, 5(4), 2011.
- [121]Prabhakaran, M. P., Ghasemi-Mobarakeh, L. and Ramakrishna, S. Electrospun composite nanofibers for tissue regeneration, *Journal of Nanoscience and Nanotechnology*, 11(4):3039-3057, 2011.
- [122]Ghasemi-Mobarakeh, L., Prabhakaran, M. P., Morshed, M., Nasr-Esfahani, M. H. and Ramakrishna, S. Electrical stimulation of nerve cells using conductive nanofibrous scaffolds for nerve tissue engineering, *Tissue Engineering Part A*, 15(11):3605-3619, 2009.
- [123]Das, S., Sharma, M., Saharia, D., Sarma, K.K., Muir, E.M. and Bora, U. Electrospun silk-polyaniline conduits for functional nerve regeneration in rat sciatic nerve injury model, *Biomedical Materials*, 12(4):045025, 2017.
- [124]Perumal, G., Pappuru, S., Chakraborty, D., Nandkumar, A. M., Chand, D. K. and Doble, M. Synthesis and characterization of curcumin loaded PLA-Hyperbranched polyglycerol electrospun blend for wound dressing applications, *Materials Science and Engineering C*, 76:1196-1204, 2017.
- [125]Prabhakar, P. K., Raj, S., Anuradha, P.R., Sawant, S.N. and Doble, M. Biocompatibility studies on polyaniline and polyaniline-silver nanoparticle coated polyurethane composite, *Colloids and Surfaces B: Biointerfaces*, 86(1):146-153, 2011.
- [126]Basha, R. Y. and Doble, M. Design of biocomposite materials for bone tissue regeneration, *Materials Science and Engineering: C*, 57:452-463, 2015.
- [127]Contractor, A. Q., Sureshkumar, T. N., Narayanan, R., Sukeerthi, S., Lal, R. and Srinivasa, R. S. Conducting polymer-based biosensors, *Electrochimica Acta*, 39(8-9):1321-1324, 1994.
- [128]Gerard, M., Chaubey, A. and Malhotra, B. D. Application of conducting polymers to biosensors, *Biosensors and bioelectronics*, 17(5):345-359, 2002.
- [129]Malhotra, B. D., Chaubey, A. and Singh, S. P. Prospects of conducting polymers in biosensors, *Analytica chimica acta*, 578(1):59-74, 2006.

References

- [130] Green, R. A., Lovell, N. H., Wallace, G. G. and Poole-Warren, L. A. Conducting polymers for neural interfaces: challenges in developing an effective long-term implant, *Biomaterials*, 29(24-25):3393-3399, 2008.
- [131] Cui, X., Lee, V. A., Raphael, Y., Wiler, J. A., Hetke, J. F., Anderson, D. J. and Martin, D. C. Surface modification of neural recording electrodes with conducting polymer/biomolecule blends, *Journal of Biomedical Materials Research Part A*, 56(2):261-272, 2001.
- [132] Cui, X., Hetke, J. F., Wiler, J. A., Anderson, D. J. and Martin, D. C. Electrochemical deposition and characterization of conducting polymer polypyrrole/PSS on multichannel neural probes, *Sensors and Actuators A: Physical*, 93(1):8-18, 2001.
- [133] Pernaut, J. M. and Reynolds, J. R. Use of conducting electroactive polymers for drug delivery and sensing of bioactive molecules. A redox chemistry approach, *The Journal of Physical Chemistry B*, 104(17):4080-4090, 2000.
- [134] Svirskis, D., Travas-Sejdic, J., Rodgers, A. and Garg, S. Electrochemically controlled drug delivery based on intrinsically conducting polymers, *Journal of Controlled Release*, 146(1):6-15, 2010.
- [135] Bajpai, A. K., Shukla, S. K., Bhanu, S. and Kankane, S. Responsive polymers in controlled drug delivery, *Progress in Polymer Science*, 33(11):1088-1118, 2008.
- [136] Shin, M. K., Spinks, G. M., Shin, S. R., Kim, S. I. and Kim, S. J. Nanocomposite hydrogel with high toughness for Bioactuators, *Advanced Materials*, 21(17):1712-1715, 2009.
- [137] Kaur, G., Adhikari, R., Cass, P., Bown, M. and Gunatillake, P. Electrically conductive polymers and composites for biomedical applications, *RSC Advances*, 5(47):37553-37567, 2015.
- [138] Aydemir, N., Malmström, J. and Travas-Sejdic, J. Conducting polymer based electrochemical biosensors, *Physical Chemistry Chemical Physics*, 18(12):8264-8277, 2016.
- [139] Guimard, N. K., Gomez, N. and Schmidt, C. E. Conducting polymers in biomedical engineering, *Progress In Polymer Science*, 32(8-9):876-921, 2007.
- [140] Abasıyanık, M. F. and Şenel, M. Immobilization of glucose oxidase on reagentless ferrocene-containing polythiophene derivative and its glucose sensing application, *Journal of Electroanalytical Chemistry*, 639(1-2):21-26, 2010.

References

- [141] Welzel, H. P., Kossmehl, G., Engelmann, G., Neumann, B., Wollenberger, U., Scheller, F. and Schröder, W. Reactive groups on polymer covered electrodes, 4. Lactate-oxidase-biosensor based on electrodes modified by polythiophene, *Macromolecular Chemistry and Physics*, 197(10):3355-3363, 1996.
- [142] Baek, M. G., Stevens, R. C. and Charych, D. H. Design and synthesis of novel glycopolythiophene assemblies for colorimetric detection of influenza virus and E. coli, *Bioconjugate Chemistry*, 11(6):777-788, 2000.
- [143] Minett, A. I., Barisci, J. N. and Wallace, G. G. Immobilisation of anti-Listeria in a polypyrrole film, *Reactive and Functional Polymers*, 53(2-3):217-227, 2002.
- [144] Minett, A. I., Barisci, J. N. and Wallace, G. G. Coupling conducting polymers and mediated electrochemical responses for the detection of Listeria, *Analytica Chimica Acta*, 475(1-2):37-45, 2003.
- [145] Livache, T., Roget, A., Dejean, E., Barthet, C., Bidan, G. and Teoule, R. Preparation of a DNA matrix via an electrochemically directed copolymerization of pyrrole and oligonucleotides bearing a pyrrole group, *Nucleic Acids Research*, 22(15):2915-2921, 1994.
- [146] Lassalle, N., Roget, A., Livache, T., Mailley, P. and Vieil, E. Electropolymerisable pyrrole-oligonucleotide: synthesis and analysis of ODN hybridisation by fluorescence and QCM, *Talanta*, 55(5):993-1004, 2001.
- [147] Wehrle, U., Düsterhöft, S. and Pette, D. Effects of chronic electrical stimulation on myosin heavy chain expression in satellite cell cultures derived from rat muscles of different fiber-type composition, *Differentiation*, 58(1):37-46, 1994.
- [148] Xia, Y., Buja, L. M., Scarpulla, R. C. and McMillin, J. B. Electrical stimulation of neonatal cardiomyocytes results in the sequential activation of nuclear genes governing mitochondrial proliferation and differentiation, *Proceedings of the National Academy of Sciences*, 94(21):11399-11404, 1997.
- [149] Gumus, A., Califano, J. P., Wan, A. M., Huynh, J., Reinhart-King, C. A. and Malliaras, G. G. Control of cell migration using a conducting polymer device, *Soft Matter*, 6(20):5138-5142, 2010.
- [150] Nagarajan, R., Liu, W., Kumar, J., Tripathy, S. K., Bruno, F. F. and Samuelson, L. A. Manipulating DNA conformation using intertwined conducting polymer chains, *Macromolecules*, 34(12):3921-3927, 2001.

References

- [151] Nandi, S., Kundu, A., Das, P. and Nandi, A. K. Facile Synthesis of Water Soluble, Fluorescent DNA-Polymer Conjugate via Enzymatic Polymerization for Cell Imaging, *Journal of Nanoscience and Nanotechnology*, 17(8):5168-5174, 2017.
- [152] Zhu, B., Luo, S. C., Zhao, H., Lin, H. A., Sekine, J., Nakao, A., Chen, C., Yamashita, Y. and Yu, H. H. Large enhancement in neurite outgrowth on a cell membrane-mimicking conducting polymer, *Nature Communications*, 5:4523, 2014.
- [153] Higgins, M. J., Molino, P. J., Yue, Z. and Wallace, G. G. Organic conducting polymer-protein interactions, *Chemistry of Materials*, 24(5):828-839, 2012.
- [154] Garner, B., Georgevich, A., Hodgson, A. J., Liu, L. and Wallace, G. G. Polypyrrole-heparin composites as stimulus-responsive substrates for endothelial cell growth, *Journal of Biomedical Materials Research Part A*, 44(2):121-129, 1999.
- [155] Lee, J. Y., Bashur, C. A., Goldstein, A. S. and Schmidt, C. E. Polypyrrole-coated electrospun PLGA nanofibers for neural tissue applications, *Biomaterials*, 30(26):4325-4335, 2009.
- [156] Kim, D.H., Richardson-Burns, S.M., Hendricks, J.L., Sequera, C. and Martin, D.C. Effect of immobilized nerve growth factor on conductive polymers: electrical properties and cellular response, *Advanced Functional Materials*, 17(1):79-86, 2007.
- [157] Bidez, P. R., Li, S., MacDiarmid, A. G., Venancio, E. C., Wei, Y. and Lelkes, P. I. Polyaniline, an electroactive polymer, supports adhesion and proliferation of cardiac myoblasts, *Journal of Biomaterials Science, Polymer Edition*, 17(1-2):199-212, 2006.
- [158] Abidian, M.R., Corey, J.M., Kipke, D.R. and Martin, D.C. Conducting-polymer nanotubes improve electrical properties, mechanical adhesion, neural attachment, and neurite outgrowth of neural electrodes, *Small*, 6(3):421-429, 2010.
- [159] Laura, M. Y., Leipzig, N. D. and Shoichet, M. S. Promoting neuron adhesion and growth, *Materials today*, 11(5):36-43, 2008.
- [160] Ateh, D. D., Vadgama, P. and Navsaria, H. A. Culture of human keratinocytes on polypyrrole-based conducting polymers, *Tissue engineering*, 12(4):645-655, 2006.
- [161] Castano, H., O'Rear, E. A., McFetridge, P. S. and Sikavitsas, V. I. Polypyrrole thin films formed by admicellar polymerization support the osteogenic

References

- differentiation of mesenchymal stem cells, *Macromolecular Bioscience*, 4(8):785-794, 2004.
- [162] Schmidt, C. E., Shastri, V. R., Vacanti, J. P. and Langer, R. Stimulation of neurite outgrowth using an electrically conducting polymer, *Proceedings of the National Academy of Sciences*, 94(17):8948-8953, 1997.
- [163] Ghezzi, D., Antognazza, M.R., Maccarone, R., Bellani, S., Lanzarini, E., Martino, N., Mete, M., Pertile, G., Bisti, S., Lanzani, G. and Benfenati, F. A polymer optoelectronic interface restores light sensitivity in blind rat retinas, *Nature Photonics*, 7(5):400, 2013.
- [164] Quigley, A. F., Razal, J. M., Thompson, B. C., Moulton, S. E., Kita, M., Kennedy, E. L., Clark, G. M., Wallace, G. G. and Kapsa, R. M. A Conducting-Polymer Platform with Biodegradable Fibers for Stimulation and Guidance of Axonal Growth, *Advanced Materials*, 21(43):4393-4397, 2009.
- [165] Prabhakaran, M.P., Ghasemi-Mobarakeh, L., Jin, G. and Ramakrishna, S. Electrospun conducting polymer nanofibers and electrical stimulation of nerve stem cells, *Journal of Bioscience and Bioengineering*, 112(5):501-507, 2011.
- [166] Zhang, Z., Rouabhia, M., Wang, Z., Roberge, C., Shi, G., Roche, P., Li, J. and Dao, L. H. Electrically conductive biodegradable polymer composite for nerve regeneration: electricity-stimulated neurite outgrowth and axon regeneration, *Artificial Organs*, 31(1):13-22, 2007.
- [167] Ravichandran, R., Sundarajan, S., Venugopal, J. R., Mukherjee, S. and Ramakrishna, S. Applications of conducting polymers and their issues in biomedical engineering, *Journal of the Royal Society Interface*, p.rsif20100120, 2010.
- [168] Poole-Warren, L., Lovell, N., Baek, S. and Green, R. Development of bioactive conducting polymers for neural interfaces, *Expert review of medical devices*, 7(1):35-49, 2010.
- [169] Green, R. A., Lovell, N. H. and Poole-Warren, L. A. Cell attachment functionality of bioactive conducting polymers for neural interfaces, *Biomaterials*, 30(22):3637-3644, 2009.
- [170] Samba, R., Herrmann, T. and Zeck, G. PEDOT–CNT coated electrodes stimulate retinal neurons at low voltage amplitudes and low charge densities, *Journal of Neural Engineering*, 12(1):016014, 2015.

References

- [171]Urban, G., Jobst, G., Keplinger, F., Aschauer, E., Tilado, O., Fasching, R. and Kohl, F. Miniaturized multi-enzyme biosensors integrated with pH sensors on flexible polymer carriers for in vivo applications, *Biosensors and Bioelectronics*, 7(10):733-739, 1992.
- [172]Wadhwa, R., Lagenaur, C. F. and Cui, X. T. Electrochemically controlled release of dexamethasone from conducting polymer polypyrrole coated electrode, *Journal of Controlled Release*, 110(3):531-541, 2006.
- [173]Otero, T. F. and Sansinena, J. M. Bilayer dimensions and movement in artificial muscles, *Bioelectrochemistry and Bioenergetics*, 42(2):117-122, 1997.
- [174]Otero, T. F. and Sansieña, J. M. Soft and wet conducting polymers for artificial muscles, *Advanced Materials*, 10(6):491-494, 1998.
- [175]Spinks, G. M., Campbell, T. E. and Wallace, G. G. Force generation from polypyrrole actuators, *Smart Materials and Structures*, 14(2):406, 2005.
- [176]Spinks, G. M., Xi, B., Truong, V. T. and Wallace, G. G. Actuation behaviour of layered composites of polyaniline, carbon nanotubes and polypyrrole, *Synthetic Metals*, 151(1):85-91, 2005.
- [177]Spinks, G. M., Mottaghitlab, V., Bahrami-Samani, M., Whitten, P. G. and Wallace, G. G. Carbon-nanotube-reinforced polyaniline fibers for high-strength artificial muscles, *Advanced Materials*, 18(5):637-640, 2006.
- [178]Freed, L. E., Marquis, J. C., Nohria, A., Emmanuel, J., Mikos, A. G. and Langer, R. Neocartilage formation *in vitro* and *in vivo* using cells cultured on synthetic biodegradable polymers, *Journal of Biomedical Materials Research Part A*, 27(1):11-23, 1993.
- [179]Zhang, Y. and Zhang, M. Three-dimensional macroporous calcium phosphate bioceramics with nested Chitosan sponges for load-bearing bone implants, *Journal of Biomedical Materials Research Part A*, 61(1):1-8, 2002.
- [180]Murugan, R. and Ramakrishna, S. Design strategies of tissue engineering scaffolds with controlled fiber orientation, *Tissue Engineering*, 13(8):1845-1866, 2007.
- [181]Martino, S., D'Angelo, F., Armentano, I., Kenny, J. M. and Orlicchio, A. Stem cell-biomaterial interactions for regenerative medicine, *Biotechnology Advances*, 30(1):338-351, 2012.

References

- [182] Elbert, D. L. and Hubbell, J. A. Surface treatments of polymers for biocompatibility, *Annual Review of Materials Science*, 26(1):365-394, 1996.
- [183] Xiao, Y., Li, C. M., Wang, S., Shi, J. and Ooi, C. P. Incorporation of collagen in poly (3, 4-ethylenedioxythiophene) for a bifunctional film with high bio-and electrochemical activity, *Journal of Biomedical Materials Research Part A*, 92(2), 766-772, 2010.
- [184] Stavrinidou, E., Winther-Jensen, O., Shekibi, B. S., Armel, V., Rivnay, J., Ismailova, E., Sanaur, S., Malliaras, G. G. and Winther-Jensen, B. Engineering hydrophilic conducting composites with enhanced ion mobility, *Physical Chemistry Chemical Physics*, 16(6):2275-2279, 2014.
- [185] Teixeira-Dias, B., del Valle, L.J., Aradilla, D., Estrany, F. and Alemán, C. A conducting polymer/protein composite with bactericidal and electroactive properties, *Macromolecular Materials and Engineering*, 297(5):427-436, 2012.
- [186] Lv, R., Sun, Y., Yu, F. and Zhang, H. Fabrication of poly (3, 4-ethylenedioxythiophene)-polysaccharide composites, *Journal of Applied Polymer Science*, 124(1):855-863, 2012.
- [187] Teixeira-Dias, B., del Valle, L. J., Estrany, F., Mano, J. F., Reis, R. L. and Alemán, C. Dextrin-and Conducting-Polymer-Containing Biocomposites: Properties and Behavior as Cellular Matrix, *Macromolecular Materials and Engineering*, 297(4):359-368, 2012.
- [188] Chung, T. W., Lai, D. M., Chen, S. D. and Lin, Y. I. Poly (ϵ -caprolactone) scaffolds functionalized by grafting NGF and GRGD promote growth and differentiation of PC12 cells, *Journal of Biomedical Materials Research Part A*, 102(2):315-323, 2014.
- [189] Shamaeli, E. and Alizadeh, N. Nanostructured biocompatible thermal/electrical stimuli-responsive biopolymer-doped polypyrrole for controlled release of chlorpromazine: kinetics studies, *International Journal of Pharmaceutics*, 472(1-2):327-338, 2014.
- [190] Gilmore, K. J., Kita, M., Han, Y., Gelmi, A., Higgins, M. J., Moulton, S. E., Clark, G. M., Kapsa, R. and Wallace, G. G. Skeletal muscle cell proliferation and differentiation on polypyrrole substrates doped with extracellular matrix components, *Biomaterials*, 30(29):5292-5304, 2009.

References

- [191] Kim, D. H., Richardson-Burns, S. M., Hendricks, J. L., Sequera, C. and Martin, D. C. Effect of immobilized nerve growth factor on conductive polymers: electrical properties and cellular response, *Advanced Functional Materials*, 17(1):79-86, 2007.
- [192] Long, Y. Z., Li, M. M., Gu, C., Wan, M., Duvail, J. L., Liu, Z. and Fan, Z. Recent advances in synthesis, physical properties and applications of conducting polymer nanotubes and nanofibers, *Progress in Polymer Science*, 36(10):1415-1442, 2011.
- [193] Lu, X., Zhang, W., Wang, C., Wen, T. C. and Wei, Y. One-dimensional conducting polymer nanocomposites: synthesis, properties and applications, *Progress in Polymer Science*, 36(5):671-712, 2011.
- [194] Tran, H. D., Li, D. and Kaner, R. B. One-dimensional conducting polymer nanostructures: bulk synthesis and applications, *Advanced Materials*, 21(14-15):1487-1499, 2009.
- [195] Xia, L., Wei, Z. and Wan, M. Conducting polymer nanostructures and their application in biosensors, *Journal of Colloid and Interface Science*, 341(1):1-11, 2010.
- [196] Balint, R., Cassidy, N. J. and Cartmell, S. H. Conductive polymers: towards a smart biomaterial for tissue engineering, *Acta Biomaterialia*, 10(6):2341-2353, 2014.
- [197] Parthasarathy, R. V. and Martin, C. R. Synthesis of polymeric microcapsule arrays and their use for enzyme immobilization, *Nature*, 369(6478):298, 1994.
- [198] Parthasarathy, R. V. and Martin, C. R. Template-synthesized polyaniline microtubules, *Chemistry of Materials*, 6(10):1627-1632, 1994.
- [199] Ozin, G.A. Nanochemistry: synthesis in diminishing dimensions, *Advanced Materials*, 4(10):612-649, 1992.
- [200] Van Dyke, L. S. and Martin, C. R. Electrochemical investigations of electronically conductive polymers. 4. Controlling the supermolecular structure allows charge transport rates to be enhanced, *Langmuir*, 6(6):1118-1123, 1990.
- [201] Guo, Y., Tang, Q., Liu, H., Zhang, Y., Li, Y., Hu, W., Wang, S. and Zhu, D. Light-controlled organic/inorganic P-N junction nanowires, *Journal of the American Chemical Society*, 130(29):9198-9199, 2008.

References

- [202] Gence, L., Faniel, S., Gustin, C., Melinte, S., Bayot, V., Callegari, V., Reynes, O. and Demoustier-Champagne, S. Structural and electrical characterization of hybrid metal-polypyrrole nanowires, *Physical Review B*, 76(11):115415, 2007.
- [203] Callegari, V., Gence, L., Melinte, S. and Demoustier-Champagne, S. Electrochemically template-grown multi-segmented gold-conducting polymer nanowires with tunable electronic behavior, *Chemistry of Materials*, 21(18):4241-4247, 2009.
- [204] Liu, R. and Lee, S. B. MnO₂/poly(3,4-ethylenedioxythiophene) coaxial nanowires by one-step coelectrodeposition for electrochemical energy storage, *Journal of the American Chemical Society*, 130(10):2942-2943, 2008.
- [205] Lorcy, J. M., Massuyeau, F., Moreau, P., Chauvet, O., Faulques, E., Wery, J. and Duvail, J. L. Coaxial nickel/poly (p-phenylene vinylene) nanowires as luminescent building blocks manipulated magnetically, *Nanotechnology*, 20(40):405601, 2009.
- [206] Zhang, X., Goux, W. J. and Manohar, S. K. Synthesis of polyaniline nanofibers by “nanofiber seeding”, *Journal of the American Chemical Society*, 126(14):4502-4503, 2004.
- [207] Zhang, X. and Manohar, S. K. Bulk synthesis of polypyrrole nanofibers by a seeding approach, *Journal of the American Chemical Society*, 126(40):12714-12715, 2004.
- [208] Zhang, X. and Manohar, S. K. Narrow pore-diameter polypyrrole nanotubes, *Journal of the American Chemical Society*, 127(41):14156-14157, 2005.
- [209] Huang, J. and Kaner, R. B. A general chemical route to polyaniline nanofibers, *Journal of the American Chemical Society*, 126(3):851-855, 2004.
- [210] Chiou, N. R. and Epstein, A. J. Polyaniline nanofibers prepared by dilute polymerization, *Advanced Materials*, 17(13):1679-1683, 2005.
- [211] Wan, M. A template-free method towards conducting polymer nanostructures, *Advanced Materials*, 20(15):2926-2932, 2008.
- [212] Wan, M., Huang, J. and Shen, Y. Microtubes of conducting polymers, *Synthetic metals*, 101(1-3):708-711, 1999.
- [213] Jang, J. and Yoon, H. Facile fabrication of polypyrrole nanotubes using reverse microemulsion polymerization, *Chemical Communications*, (6):720-721, 2003.

References

- [214] Liu, H., Hu, X. B., Wang, J. Y. and Boughton, R. I. Structure, conductivity, and thermopower of crystalline polyaniline synthesized by the ultrasonic irradiation polymerization method, *Macromolecules*, 35(25):9414-9419, 2002.
- [215] Pillalamarri, S. K., Blum, F. D., Tokuhiko, A. T., Story, J. G. and Bertino, M. F. Radiolytic synthesis of polyaniline nanofibers: a new templateless pathway, *Chemistry of Materials*, 17(2):227-229, 2005.
- [216] Li, Y., Gong, J., He, G. and Deng, Y. Synthesis of polyaniline nanotubes using Mn₂O₃ nanofibers as oxidant and their ammonia sensing properties, *Synthetic Metals*, 161(1-2):56-61:2011.
- [217] Yang, X., Zhu, Z., Dai, T. and Lu, Y. Facile Fabrication of Functional Polypyrrole Nanotubes via a Reactive Self-Degraded Template, *Macromolecular Rapid Communications*, 26(21):1736-1740, 2005.
- [218] Zhang, F., Nyberg, T. and Inganäs, O. Conducting polymer nanowires and nanodots made with soft lithography, *Nano Letters*, 2(12):1373-1377, 2002.
- [219] Hu, Z., Muls, B., Gence, L., Serban, D. A., Hofkens, J., Melinte, S., Nysten, B., Demoustier-Champagne, S. and Jonas, A. M. High-throughput fabrication of organic nanowire devices with preferential internal alignment and improved performance, *Nano Letters*, 7(12):3639-3644, 2007.
- [220] Huang, C., Dong, B., Lu, N., Yang, B., Gao, L., Tian, L., Qi, D., Wu, Q. and Chi, L. A strategy for patterning conducting polymers using nanoimprint lithography and isotropic plasma etching, *Small*, 5(5):583-586, 2009.
- [221] Li, M., Wei, Z. and Jiang, L. Polypyrrole nanofiber arrays synthesized by a biphasic electrochemical strategy, *Journal of Materials Chemistry*, 18(19):2276-2280, 2008.
- [222] Ahuja, T. and Kumar, D. Recent progress in the development of nano-structured conducting polymers/nanocomposites for sensor applications, *Sensors and Actuators B: Chemical*, 136(1):275-286, 2009.
- [223] Yun, M., Myung, N. V., Vasquez, R. P., Lee, C., Menke, E. and Penner, R. M., Electrochemically grown wires for individually addressable sensor arrays, *Nano Letters*, 4(3):419-422, 2004.
- [224] Das, A., Lei, C. H., Elliott, M., Macdonald, J. E. and Turner, M. L. Non-lithographic fabrication of PEDOT nano-wires between fixed Au electrodes, *Organic electronics*, 7(4):181-187, 2006.

References

- [225]Huang, Z. M., Zhang, Y. Z., Kotaki, M. and Ramakrishna, S. A review on polymer nanofibers by electrospinning and their applications in nanocomposites, *Composites Science and Technology*, 63(15):2223-2253, 2003.
- [226]Min, B. M., Lee, G., Kim, S. H., Nam, Y. S., Lee, T. S. and Park, W. H. Electrospinning of silk fibroin nanofibers and its effect on the adhesion and spreading of normal human keratinocytes and fibroblasts in vitro, *Biomaterials*, 25(7-8):1289-1297, 2004.
- [227]Norris, I.D., Shaker, M.M., Ko, F.K. and MacDiarmid, A.G., Electrostatic fabrication of ultrafine conducting fibers: polyaniline/polyethylene oxide blends, *Synthetic Metals*, 114(2):109-114, 2000.
- [228]Ribeiro, S., Correia, D.M., Ribeiro, C. and Lanceros-Méndez, S. *Electrospun Polymeric Smart Materials for Tissue Engineering Applications*. In *Electrospun Biomaterials and Related Technologies*, Springer, Cham, 251-282, 2017.
- [229]Li, M., Guo, Y., Wei, Y., MacDiarmid, A. G. and Lelkes, P. I. Electrospinning polyaniline-contained gelatin nanofibers for tissue engineering applications, *Biomaterials*, 27(13):2705-2715, 2006.
- [230]Ahuja, T., Mir, I. A. and Kumar, D. Biomolecular immobilization on conducting polymers for biosensing applications, *Biomaterials*, 28(5):791-805, 2007.
- [231]Prabhakar, N., Arora, K., Singh, S. P., Singh, H. and Malhotra, B. D. DNA entrapped polypyrrole–polyvinyl sulfonate film for application to electrochemical biosensor, *Analytical Biochemistry*, 366(1):71-79, 2007.
- [232]Genies, E.M. and Marchesiello, M. Conducting polymers for biosensors, application to new glucose sensors GOD entrapped into polypyrrole, GOD adsorbed on poly (3-methylthiophene), *Synthetic Metals*, 57(1):3677-3682, 1993.
- [233]Ma, Z., Mao, Z. and Gao, C. Surface modification and property analysis of biomedical polymers used for tissue engineering, *Colloids and Surfaces B: Biointerfaces*, 60(2):137-157, 2007.
- [234]Goddard, J. M. and Hotchkiss, J. H. Polymer surface modification for the attachment of bioactive compounds, *Progress in Polymer Science*, 32(7):698-725, 2007.
- [235]Rasmussen, J. R., Stedronsky, E. R. and Whitesides, G. M. Introduction, modification, and characterization of functional groups on the surface of low-density polyethylene film, *Journal of the American Chemical Society*, 99(14):4736-4745, 1977.

References

- [236] Holmberg, K. and Hydén, H. Methods of immobilization of proteins to polymethylmethacrylate, *Preparative Biochemistry*, 15(5):309-319, 1985.
- [237] Serman, S. and Marsden, J. G. Silane coupling agents, *Industrial & Engineering Chemistry*, 58(3):33-37, 1966.
- [238] Yan, L., Huck, W. T. and Whitesides, G. M. Self-Assembled Monolayers (SAMs) and Synthesis of Planar Micro-and Nanostructures, *Journal of Macromolecular Science, Part C: Polymer Reviews*, 44(2):175-206, 2004.
- [239] Faucheux, N., Schweiss, R., Lützow, K., Werner, C. and Groth, T. Self-assembled monolayers with different terminating groups as model substrates for cell adhesion studies, *Biomaterials*, 25(14):2721-2730, 2004.
- [240] Balas, F., Kawashita, M., Nakamura, T. and Kokubo, T. Formation of bone-like apatite on organic polymers treated with a silane-coupling agent and a titania solution, *Biomaterials*, 27(9):1704-1710, 2006.
- [241] Xia, Y., Zhao, X. M. and Whitesides, G. M. Pattern transfer: Self-assembled monolayers as ultrathin resists, *Microelectronic Engineering*, 32(1-4):255-268, 1996.
- [242] Dinklage A, Klinger T, Marx G, Schweikhard L. *Plasma Physics*. Springer, New York, USA, 2005.
- [243] Chan, C. M., Ko, T. M. and Hiraoka, H. Polymer surface modification by plasmas and photons, *Surface Science Reports*, 24(1-2):1-54, 1996.
- [244] Lane, J. M. and Hourston, D. J. Surface treatments of polyolefins, *Progress In Organic Coatings*, 21(4):269-284, 1993.
- [245] Desai, S. M. and Singh, R. P. *Surface modification of polyethylene. In Long Term Properties of Polyolefins*. Springer, Berlin, Heidelberg, 2004.
- [246] Briggs, D., Brewis, D. M., Dahm, R. H. and Fletcher, I. W. Analysis of the surface chemistry of oxidized polyethylene: comparison of XPS and ToF-SIMS, *Surface and Interface Analysis*, 35(2):156-167, 2003.
- [247] Situma, C., Wang, Y., Hupert, M., Barany, F., McCarley, R. L. and Soper, S. A. Fabrication of DNA microarrays onto poly (methyl methacrylate) with ultraviolet patterning and microfluidics for the detection of low-abundant point mutations, *Analytical Biochemistry*, 340(1):123-135, 2005.

References

- [248] Nahar, P., Naqvi, A. and Basir, S. F. Sunlight-mediated activation of an inert polymer surface for covalent immobilization of a protein, *Analytical Biochemistry*, 327(2):162-164, 2004.
- [249] Chao, T. I., Xiang, S., Lipstate, J. F., Wang, C. and Lu, J. Poly (methacrylic acid)-Grafted Carbon Nanotube Scaffolds Enhance Differentiation of hESCs into Neuronal Cells, *Advanced Materials*, 22(32):3542-3547, 2010.
- [250] Serrano, M. C., Nardecchia, S., García-Rama, C., Ferrer, M. L., Collazos-Castro, J. E., del Monte, F. and Gutiérrez, M. C. Chondroitin sulphate-based 3D scaffolds containing MWCNTs for nervous tissue repair, *Biomaterials*, 35(5):1543-1551, 2014.
- [251] Haastert-Talini, K. and Grothe, C. Electrical stimulation for promoting peripheral nerve regeneration, *International Review of Neurobiology*, 109:111-124, 2013.
- [252] Gomez, N. and Schmidt, C. E. Nerve growth factor-immobilized polypyrrole: Bioactive electrically conducting polymer for enhanced neurite extension, *Journal of Biomedical Materials Research Part A*, 81(1):135-149, 2007.
- [253] Xu, H., Holzwarth, J. M., Yan, Y., Xu, P., Zheng, H., Yin, Y., Li, S. and Ma, P. X. Conductive PPY/PDLLA conduit for peripheral nerve regeneration, *Biomaterials*, 35(1):225-235, 2014.
- [254] Weng, B., Liu, X., Shepherd, R. and Wallace, G. G., Inkjet printed polypyrrole/collagen scaffold: A combination of spatial control and electrical stimulation of PC12 cells, *Synthetic Metals*, 162(15-16):1375-1380, 2012.
- [255] Liu, X., Gilmore, K. J., Moulton, S. E. and Wallace, G. G. Electrical stimulation promotes nerve cell differentiation on polypyrrole/poly (2-methoxy-5 aniline sulfonic acid) composites, *Journal of Neural Engineering*, 6(6):065002, 2009.
- [256] Jeong, S. I., Jun, I. D., Choi, M. J., Nho, Y. C., Lee, Y. M. and Shin, H. Development of Electroactive and Elastic Nanofibers that contain Polyaniline and Poly (L-lactide-co- ϵ -caprolactone) for the Control of Cell Adhesion, *Macromolecular Bioscience*, 8(7):627-637, 2008.
- [257] Hsiao, C. W., Bai, M. Y., Chang, Y., Chung, M. F., Lee, T. Y., Wu, C. T., Maiti, B., Liao, Z. X., Li, R. K. and Sung, H. W. Electrical coupling of isolated cardiomyocyte clusters grown on aligned conductive nanofibrous meshes for their synchronized beating, *Biomaterials*, 34(4):1063-1072, 2013.

References

- [258] Richardson, R.T., Thompson, B., Moulton, S., Newbold, C., Lum, M. G., Cameron, A., Wallace, G., Kapsa, R., Clark, G. and O'Leary, S. The effect of polypyrrole with incorporated neurotrophin-3 on the promotion of neurite outgrowth from auditory neurons, *Biomaterials*, 28(3):513-523, 2007.
- [259] Bendorf, A., Kelly, P. J., Kerridge, I. H., McCaughan, G. W., Myerson, B., Stewart, C. and Pussell, B. A. An international comparison of the effect of policy shifts to organ donation following cardiocirculatory death (DCD) on donation rates after brain death (DBD) and transplantation rates, *PLoS One*, 8(5):e62010, 2013.
- [260] Hernandez-Alejandro, R., Caumartin, Y., Marotta, P. J., Ghent, C., Levstik, M. A., Quan, D., Muirhead, N., House, A. A., McAlister, V., Jevnikar, A. M. and Luke, P. P. Kidney and liver transplants from donors after cardiac death: initial experience at the London Health Sciences Centre, *Canadian Journal of Surgery*, 53(2):93, 2010.
- [261] Tania Goklany, *In Numbers: The Status Of Organ Donation In India*, August 22, 2017 from <http://sites.ndtv.com/moretogive/numbers-status-organ-donation-india-221/>
- [262] Nisha, S. A. Assessment of knowledge and attitude on organ donation among general public at puducherry, *International Journal of Current Research*, 9(09):57310-57313, 2017.
- [263] Aastha Ahuja, *Lack of Organ Donation In India: Here Is Why Half A Million People Die Annually In India Due To Unavailability Of Organs*, November 26, 2017 from <http://sites.ndtv.com/moretogive/lack-organ-donation-india-half-million-people-die-annually-india-due-unavailability-organs-2107/>
- [264] *CountryFocus: Healthcare, Regulatory and Reimbursement Landscape-France*, GlobalData, France, 2017.
- [265] Guarino, V., Zuppolini, S., Borriello, A. and Ambrosio, L. Electro-active polymers (EAPs): a promising route to design bio-organic/bioinspired platforms with on demand functionalities, *Polymers*, 8(5):185, 2016.
- [266] Bunker, B. C., Rieke, P. C., Tarasevich, B. J., Campbell, A. A., Fryxell, G. E., Graff, G. L., Song, L., Liu, J., Virden, J. W. and McVay, G. L. Ceramic thin-film formation on functionalized interfaces through biomimetic processing, *Science*, 264(5155):48-55, 1994.

References

- [267] Chiou, N. R. *Aligned and oriented polyaniline nanofibers: fabrication and applications*. PhD thesis, The Ohio State University, 2006.
- [268] Kashchiev, D. and Van Rosmalen, G. M. Nucleation in solutions revisited, *Crystal Research and Technology*, 38(7-8):555-574, 2003.
- [269] Mattoso, L. H., MacDiarmid, A. G. and Epstein, A. J. Controlled synthesis of high molecular weight polyaniline and poly (o-methoxyaniline), *Synthetic Metals*, 68(1):1-11, 1994.
- [270] Surwade, S. P., Manohar, N. and Manohar, S. K. Origin of bulk nanoscale morphology in conducting polymers, *Macromolecules*, 42(6):1792-1795, 2009.
- [271] Ingavle, G. C. and Leach, J. K. Advancements in electrospinning of polymeric nanofibrous scaffolds for tissue engineering, *Tissue Engineering Part B: Reviews*, 20(4):277-293, 2013.
- [272] Bright, A. W. and Makin, B. Polar liquids: A survey of purification, conduction mechanisms, and interfacial effects, *Journal of Materials Science*, 2(2):184-193, 1967.
- [273] Ushakov, V. Y. *Impulse breakdown of liquids*. Springer, New York, 2007.
- [274] Zomer Volpato, F. *Composites for Biomedical Applications*. PhD thesis, University of Trento, 2010.
- [275] Taylor, G. I. Deposition of a viscous fluid on the wall of a tube, *Journal of Fluid Mechanics*, 10(02):161-165, 1961.
- [276] Buer, A., Ugbolue, S. C. and Warner, S. B. Electrospinning and properties of some nanofibers, *Textile Research Journal*, 71(4):323-328, 2001.
- [277] Reneker, D. H., Yarin, A. L., Fong, H. and Koombhongse, S. Bending instability of electrically charged liquid jets of polymer solutions in electrospinning, *Journal of Applied Physics*, 87(9):4531, 2000.
- [278] Pasveer, W. F., Cottaar, J., Tanase, C., Coehoorn, R., Bobbert, P. A. & Blom, P. W. M. Unified description of charge-carrier mobilities in disordered semiconducting polymers, *Physical Review Letters*, 94(20660):1-4, 2005.
- [279] Steyrlleuthner, R., Schubert, M., Jaiser, F., Blakesley, J. C., Chen, Z., Facchetti, A. and Neher, D. Bulk Electron Transport and Charge Injection in a High Mobility n-Type Semiconducting Polymer, *Advanced Materials*, 22(25):2799-2803, 2010.
- [280] Reid, O. G., Munechika, K. and Ginger, D. S. Space charge limited current measurements on conjugated polymer films using conductive atomic force microscopy, *Nano Letters*, 8(6):1602-1609, 2008.

References

- [281] Sheng, P. Fluctuation-induced tunneling conduction in disordered materials, *Physical Review B*, 21(6):2180, 1980.
- [282] Yin, Z. H., Long, Y. Z., Gu, C. Z., Wan, M. X. and Duvail, J. L. Current–voltage characteristics in individual polypyrrole nanotube, poly (3, 4-ethylenedioxythiophene) nanowire, polyaniline nanotube, and CdS nanorope, *Nanoscale Research Letters*, 4(1):63, 2009.
- [283] Kaiser, A. B. and Park, Y. W. Current-voltage characteristics of conducting polymers and carbon nanotubes, *Synthetic Metals*, 152(1-3):181-184, 2005.
- [284] Hussain, S. A. An introduction to fluorescence resonance energy transfer (FRET). arXiv preprint arXiv:0908.1815, 2009.
- [285] Kozlov, V. G., Bulović, V., Burrows, P. E. and Forrest, S. R. Laser action in organic semiconductor waveguide and double-heterostructure devices, *Nature*, 389(6649):362:1997.
- [286] Cantor, C. R. and Schimmel, P. R. *Biophysical Chemistry Part-II*. Freeman, San Francisco, 1980.
- [287] Förster, T. 10th Spiers Memorial Lecture. Transfer mechanisms of electronic excitation, *Discussions of the Faraday Society*, 27:7-17, 1959.
- [288] Athar, H., Ahmad, N., Tayyab, S. and Qasim, M. A. Use of fluorescence enhancement technique to study bilirubin-albumin interaction, *International Journal of Biological Macromolecules*, 25:353-358, 1999.
- [289] Olmsted, J. and Kearns, D. R. Mechanisms of Ethidium Bromide Fluorescent enhancement on binding to Nucleic acid, *Biochemistry*, 16:3647-3654, 1977.
- [290] Yang, P., Yang, M. and Yang, B. S. Fluorescence enhancement effect and the interaction between donor and acceptor, *Chinese Journal of Chemistry*, 14:109-113, 1996.
- [291] Yang, M., Xi, X. and Yang, P. Thermodynamic analysis of fluorescence enhancement and quenching theory equations, *Frontiers of Chemistry in China*, 3:254-261, 2008.
- [292] Yang, M., Xi, X. and Yang, P. The equal efficiency proving of fluorescence quenching and enhancement equation, *Chinese Science Bulletin*, 50:2571-2574, 2005.
- [293] Chibowski, E. and Perea-Carpio, R. Problems of contact angle and solid surface free energy determination, *Advances in Colloid and Interface Science*, 98(2):245-264, 2002.

References

- [294] Gindl, M., Sinn, G., Gindl, W., Reiterer, A. and Tschegg, S. A comparison of different methods to calculate the surface free energy of wood using contact angle measurements, *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, 181(1-3):279-287, 2001.
- [295] Janssen, D., De Palma, R., Verlaak, S., Heremans, P. and Dehaen, W. Static solvent contact angle measurements, surface free energy and wettability determination of various self-assembled monolayers on silicon dioxide, *Thin Solid Films*, 515(4):1433-1438, 2006.
- [296] Letellier, P., Mayaffre, A. and Turmine, M. Drop size effect on contact angle explained by nonextensive thermodynamics. Young's equation revisited, *Journal of Colloid and Interface Science*, 314(2):604-614, 2007.
- [297] Gindl, M., Sinn, G., Gindl, W., Reiterer, A. and Tschegg, S. A comparison of different methods to calculate the surface free energy of wood using contact angle measurements, *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, 181(1-3):279-287, 2001.
- [298] Van Oss, C. J., Good, R. J. and Chaudhury, M. K. Additive and nonadditive surface tension components and the interpretation of contact angles, *Langmuir*, 4(4):884-891, 1988.
- [299] Lehninger, A. L. *Biochemistry*. Kalyani Publishers, New Delhi, India, 2006.
- [300] Angelopoulos, M., Asturias, G. E., Ermer, S. P., Ray, A., Scherr, E. M., MacDiarmid, A. G., Akhtar, M., Kiss, Z. and Epstein, A. J. Polyaniline: solutions, films and oxidation state, *Molecular Crystals and Liquid Crystals*, 160(1):151-163, 1988.
- [301] Migneault, I., Dartiguenave, C., Bertrand, M. J. and Waldron, K. C. Glutaraldehyde: behavior in aqueous solution, reaction with proteins, and application to enzyme crosslinking, *Biotechniques*, 37(5):790-806, 2004.
- [302] Li, W., Jang, D. M., An, S. Y., Kim, D., Hong, S. K. and Kim, H. Polyaniline-chitosan nanocomposite: high performance hydrogen sensor from new principle, *Sensors and Actuators B: Chemical*, 160(1):1020-1025, 2011.
- [303] Yan, M., Cai, S. X., Wybourne, M. N. and Keana, J. F. N-hydroxysuccinimide ester functionalized perfluorophenyl azides as novel photoactive heterobifunctional crosslinking reagents. The Covalent Immobilization of Biomolecules to Polymer Surfaces, *Bioconjugate Chemistry*, 5(2):151-157, 1994.

References

- [304] Li, W. A., Lu, B. Y., Gu, L., Choi, Y., Kim, J. and Mooney, D. J. The effect of surface modification of mesoporous silica micro-rod scaffold on immune cell activation and infiltration, *Biomaterials*, 83:249-256, 2016.
- [305] Santiago, L. Y., Nowak, R. W., Rubin, J. P. and Marra, K. G. Peptide-surface modification of poly (caprolactone) with laminin-derived sequences for adipose-derived stem cell applications, *Biomaterials*, 27(15):2962-2969, 2006.
- [306] Ruska, E. *The development of the electron microscopy and of electron microscopy*. Nobel Lecture, December 8, 1986, http://nobelprize.org/nobel_prizes/physics/laureates/1986/ruska-lecture.pdf
- [307] Kruger, D. H., Schneck, P. and Gelderblom, H. R. Helmut Ruska and the visualisation of viruses, *The Lancet*, 355(9216):1713-1717, 2000.
- [308] Kaufmann, E. N. *Characterization of Materials*, John Wiley & Sons, Inc., Hoboken, New Jersey, 2003.
- [309] Hussain, A. M. P. *Swift heavy ion irradiation effects on electrodeposited conducting polymer based electrodes for redox supercapacitors*. Ph.D. Thesis, Tezpur University, Assam, India, 2006\
- [310] Warren, B. E. and Averbach, B. L. The effect of cold-work distortion on X-ray patterns, *Journal of Applied Physics*, 21(6):595-599, 1950.
- [311] Warren, B. E. and Averbach, B. L. The separation of cold-work distortion and particle size broadening in X-ray patterns, *Journal of Applied Physics*, 23(4):497-497, 1952.
- [312] De Keijser, T. H., Langford, J. I., Mittemeijer, E. J. and Vogels, A. B. P. Use of the Voigt function in a single-line method for the analysis of X-ray diffraction line broadening, *Journal of Applied Crystallography*, 15(3):308-314, 1982.
- [313] Block, S. and Hubbard, C. R. *Accuracy in powder diffraction*. Gaithersburg, Md, 1979.
- [314] Cook, A., Hendrik Christoffel van de Hulst Ridder in de Orde van Nederlandse Leeuw, *Biograp. Mem. Fellows of the Royal Society*, 47:466-479, 2001.
- [315] Langford, J. I. A rapid method for analysing the breadths of diffraction and spectral lines using the Voigt function, *Journal of Applied Crystallography*, 11(1):10-14, 1978.

References

- [316]Nandi, R. K. and Sen Gupta, S. P. The analysis of X-ray diffraction profiles from imperfect solids by an application of convolution relations, *Journal of Applied Crystallography*, 11(1):6-9, 1978.
- [317]Young, T. III. An essay on the cohesion of fluids, *Philosophical Transactions of the Royal Society of London*, 95:65-87, 1805.
- [318]Bisht, V., Takashima, W. and Kaneto, K. An amperometric urea biosensor based on covalent immobilization of urease onto an electrochemically prepared copolymer poly (N-3-aminopropyl pyrrole-co-pyrrole) film, *Biomaterials*, 26(17):3683-3690, 2005.
- [319]Zhu, Q. Y., Holt, R. R., Lazarus, S. A. and Orozco, T. J. Inhibitory effects of cocoa flavanols and procyanidin oligomers on free radical-induced erythrocyte hemolysis, *Experimental Biology and Medicine*, 227(5):321-329, 2002.
- [320]Bartrop, J. A., Owen, T. C., Cory, A. H. and Cory, J. G. 5-(3-carboxymethoxyphenyl)-2-(4, 5-dimethylthiazolyl)-3-(4-sulfohenyl) tetrazolium, inner salt (MTS) and related analogs of 3-(4, 5-dimethylthiazolyl)-2, 5-diphenyltetrazolium bromide (MTT) reducing to purple water-soluble formazans as cell-viability indicators, *Bioorganic & Medicinal Chemistry Letters*, 1(11):611-614, 1991.
- [321]Kasibhatla, S., Amarante-Mendes, G. P., Finucane, D., Brunner, T., Bossy-Wetzel, E. and Green, D. R. Acridine orange/ethidium bromide (AO/EB) staining to detect apoptosis, *Cold Spring Harbor Protocols*, 2006(3), pp.pdb-prot4493, 2006.
- [322]Bashur, C. A., Dahlgren, L. A. and Goldstein, A. S. Effect of fiber diameter and orientation on fibroblast morphology and proliferation on electrospun poly (D, L-lactic-co-glycolic acid) meshes, *Biomaterials*, 27(33):5681-5688, 2006.
- [323]Min, B. M., Lee, G., Kim, S. H., Nam, Y. S., Lee, T. S. and Park, W. H. Electrospinning of silk fibroin nanofibers and its effect on the adhesion and spreading of normal human keratinocytes and fibroblasts in vitro, *Biomaterials*, 25(7-8):1289-1297, 2004.
- [324]Gladwin, K. M., Whitby, R. L., Mikhalovsky, S. V., Tomlins, P. and Adu, J. In vitro biocompatibility of multiwalled carbon nanotubes with sensory neurons, *Advanced Healthcare Materials*, 2(5):728-735, 2013.
- [325]Yang, H., Zhu, G., Huang, Y., Shi, X. and Wang, Y. The stimulation of the differentiation of pheochromocytoma (PC12-L) cells into neuron-like cells by

References

- electrically conductive nanofibre mesh, *Applied Materials Today*, 5:215-222, 2016.
- [326] Zou, Y., Qin, J., Huang, Z., Yin, G., Pu, X. and He, D. Fabrication of Aligned Conducting PPy-PLLA Fiber Films and Their Electrically Controlled Guidance and Orientation for Neurites, *ACS Applied Materials & Interfaces*, 8(20):12576-12582, 2016.
- [327] Yan, L., Zhao, B., Liu, X., Li, X., Zeng, C., Shi, H., Xu, X., Lin, T., Dai, L. and Liu, Y. Aligned nanofibers from polypyrrole/graphene as electrodes for regeneration of optic nerve via electrical stimulation, *ACS Applied Materials & Interfaces*, 8(11):6834-6840, 2016.
- [328] Williams, L. J. and Abdi, H. Fisher's least significant difference (LSD) test, *Encyclopedia of Research Design*, 218:840-853, 2010.
- [329] Sharma, Y., Tiwari, A., Hattori, S., Terada, D., Sharma, A. K., Ramalingam, M. and Kobayashi, H. Fabrication of conducting electrospun nanofibers scaffold for three-dimensional cells culture, *International Journal of Biological Macromolecules*, 51(4):627-631, 2012.
- [330] Chartuprayoon, N. *One-Dimensional Conducting Polymer Nanostructures for Chemical and Biological Sensor Applications*. Ph.D. thesis, University of California, Riverside, 2012.
- [331] Ryu, K. S., Kim, K. M., Park, Y. J., Park, N. G., Kang, M. G. and Chang, S. H. Redox supercapacitor using polyaniline doped with Li salt as electrode, *Solid State Ionics*, 152:861-866, 2002.
- [332] Kobayashi, T., Yoneyama, H. and Tamura, H. Polyaniline film-coated electrodes as electrochromic display devices, *Journal of Electroanalytical Chemistry and Interfacial Electrochemistry*, 161(2):419-423, 1984.
- [333] Garjonyte, R. and Malinauskas, A. Amperometric glucose biosensors based on Prussian Blue–and polyaniline–glucose oxidase modified electrodes, *Biosensors and Bioelectronics*, 15(9-10):445-451, 2000.
- [334] Choi, H. J. and Jhon, M. S. Electrorheology of polymers and nanocomposites, *Soft Matter*, 5(8):1562-1567, 2009.
- [335] Lira, L. M. and de Torresi, S. I. C. Conducting polymer–hydrogel composites for electrochemical release devices: synthesis and characterization of semi-interpenetrating polyaniline–polyacrylamide networks, *Electrochemistry Communications*, 7(7):717-723, 2005.

References

- [336] De Melo, J. V., Bello, M. E., De Azevedo, W. M., De Souza, J. M. and Diniz, F. B. The effect of glutaraldehyde on the electrochemical behavior of polyaniline, *Electrochimica Acta*, 44(14):2405-2412, 1999.
- [337] De Azevedo, W. M., De Souza, J. M. and De Melo, J. V. Semi-interpenetrating polymer networks based on polyaniline and polyvinyl alcohol–glutaraldehyde, *Synthetic Metals*, 100(3):241-248, 1999.
- [338] Shimano, J. Y. and MacDiarmid, A. G. Polyaniline, a dynamic block copolymer: key to attaining its intrinsic conductivity?, *Synthetic Metals*, 123(2):251-262, 2001.
- [339] Turkewitsch, P., Wandelt, B., Darling, G. D. and Powell, W. S. Fluorescent functional recognition sites through molecular imprinting. A polymer-based fluorescent chemosensor for aqueous cAMP, *Analytical Chemistry*, 70(10):2025-2030, 1998.
- [340] Wu, J., Liu, W., Ge, J., Zhang, H. and Wang, P. New sensing mechanisms for design of fluorescent chemosensors emerging in recent years, *Chemical Society Reviews*, 40(7):3483-3495, 2011.
- [341] Suresh, M., Shrivastav, A., Mishra, S., Suresh, E. and Das, A. A rhodamine-based chemosensor that works in the biological system, *Organic Letters*, 10(14):3013-3016, 2008.
- [342] Yoon, S., Albers, A. E., Wong, A. P. and Chang, C. J. Screening mercury levels in fish with a selective fluorescent chemosensor, *Journal of the American Chemical Society*, 127(46):16030-16031, 2005.
- [343] Wu, D., Huang, W., Lin, Z., Duan, C., He, C., Wu, S. and Wang, D. Highly sensitive multiresponsive chemosensor for selective detection of Hg²⁺ in natural water and different monitoring environments, *Inorganic Chemistry*, 47(16):7190-7201, 2008.
- [344] Pouget, J. P., Jozefowicz, M. E., Epstein, A. E. A., Tang, X. and MacDiarmid, A. G. X-ray structure of polyaniline, *Macromolecules*, 24(3):779-789, 1991.
- [345] Hazarika, J. and Kumar, A. Scalable and Low Cost Synthesis of Highly Conducting Polypyrrole Nanofibers Using Oil–Water Interfacial Polymerization under Constant Stirring, *The Journal of Physical Chemistry B*, 121(28):6926-6933, 2017.
- [346] Kao, K. C. and Hwang, W. *Electrical Transport in Solids*. Pergamon Press, New York, USA, 1981.

References

- [347] Wei, Y. and Hsueh, K. F. Thermal analysis of chemically synthesized polyaniline and effects of thermal aging on conductivity, *Journal of Polymer Science Part A: Polymer Chemistry*, 27(13):4351-4363, 1989.
- [348] Wei, Y., Jang, G.W., Hsueh, K. F., Scherr, E. M., MacDiarmid, A. G. and Epstein, A. J. Thermal transitions and mechanical properties of films of chemically prepared polyaniline, *Polymer*, 33(2):314-322, 1992.
- [349] Sariciftci, N. S., Kuzmany, H., Neugebauer, H. and Neckel, A. Structural and electronic transitions in polyaniline: a Fourier transform infrared spectroscopic study, *The Journal of Chemical Physics*, 92(7):4530-4539, 1990.
- [350] Furukawa, Y., Ueda, F., Hyodo, Y., Harada, I., Nakajima, T. and Kawagoe, T. Vibrational spectra and structure of polyaniline, *Macromolecules*, 21(5):1297-1305, 1988.
- [351] Quillard, S., Louarn, G., Lefrant, S. and MacDiarmid, A. G. Vibrational analysis of polyaniline: a comparative study of leucoemeraldine, emeraldine, and pernigraniline bases, *Physical Review B*, 50(17):12496, 1994.
- [352] Pavia, D. L., Lampman G. M., and Kriz, G. E. *Introduction to Spectroscopy*. 4th edition, 2008.
- [353] Wang, X., Sun, T., Wang, C., Wang, C., Zhang, W. and Wei, Y. ¹H NMR determination of the doping level of doped polyaniline, *Macromolecular Chemistry and Physics*, 211(16):1814-1819, 2010.
- [354] Mav, I. and Žigon, M. Synthesis and NMR characterization of a novel polyaniline derivative, *Polymer Bulletin*, 45(1):61-68, 2000.
- [355] Mathew, R., Mattes, B. R. and Espe, M. P. A solid state NMR characterization of cross-linked polyaniline powder, *Synthetic Metals*, 131(1-3):141-147, 2002.
- [356] Jian, W. *Synthesis, characterisation and applications of conducting polymer coated textiles*. Department of Chemistry, University of Wollongong, Australia, 2004.
- [357] Pron, A. and Rannou, P. Processible conjugated polymers: from organic semiconductors to organic metals and superconductors, *Progress in Polymer Science*, 27(1):135-190, 2002.
- [358] Lee, E. and Kim, E. Substituent Effects on Conformational Changes in (+)-CSA Doped Polyaniline Derivatives, *Bulletin of the Korean Chemical Society*, 34:7, 2011.

References

- [359] Amrithesh, M. *Investigations on some selected conducting polymers and polymer composites for possible optoelectronic applications*. Ph.D. thesis, Department of Physics, Cochin University of Science and Technology, India.
- [360] Lakowicz, J. R. ed. *Principles of fluorescence spectroscopy*. Springer Science & Business Media, University of Maryland School of Medicine, Maryland, 2013.
- [361] Harris, D. C. and Bertolucci, M. D. *Symmetry and spectroscopy: An introduction to vibrational and electronic spectroscopy*. Courier Corporation, New York, 1978.
- [362] Skoog, D. A. and West, D. M. *Principles of instrumental analysis*. Philadelphia, Saunders College, 1980.
- [363] Borah, R., Banerjee, S. and Kumar, A. Surface functionalization effects on structural, conformational, and optical properties of polyaniline nanofibers, *Synthetic Metals*, 197:225-232, 2014.
- [364] Owens, D. K. and Wendt, R. C. Estimation of the surface free energy of polymers, *Journal of Applied Polymer Science*, 13(8):1741-1747, 1969.
- [365] Van Oss, C. J., Absolom, D. R. and Neumann, A. W. Applications of net repulsive van der Waals forces between different particles, macromolecules, or biological cells in liquids, *Colloids and Surfaces*, 1(1):45-56, 1980.
- [366] López-Pérez, P. M., Marques, A. P., da Silva, R. M., Pashkuleva, I. and Reis, R. L. Effect of chitosan membrane surface modification via plasma induced polymerization on the adhesion of osteoblast-like cells. *Journal of Materials Chemistry*, 17(38):4064-4071, 2007.
- [367] Bayramoğlu, G., Metin, A. Ü. and Arıca, M. Y. Surface modification of polyacrylonitrile film by anchoring conductive polyaniline and determination of uricase adsorption capacity and activity, *Applied Surface Science*, 256(22):6710-6716, 2010.
- [368] Teale, F. W. J. and Weber, G. Ultraviolet fluorescence of the aromatic amino acids, *Biochemical Journal*, 65(3):476, 1957.
- [369] Teale, F. W. J. The ultraviolet fluorescence of proteins in neutral solution, *Biochemical Journal*, 76(2):381, 1960.
- [370] Griesbeck, A. G., Neudörfl, J. and de Kiff, A. Photoinduced electron-transfer chemistry of the bielectrophoric N-phthaloyl derivatives of the amino acids tyrosine, histidine and tryptophan, *Beilstein Journal of Organic Chemistry*, 7:518, 2011.

References

- [371] Abdelkader, R., Amine, H. and Mohammed, B. H-NMR spectra of conductive, anticorrosive and soluble polyaniline exchanged by an eco-catalyst layered (maghnite-H⁺), *Journal of Scientific Research and Reviews*, 2:086-092, 2013.
- [372] Yamamoto, T. and Moon, D. K. ¹H NMR spectra of polyanilines and dynamic exchange of NH hydrogen with H₂O, *Die Makromolekulare Chemie, Rapid Communications*, 14:495-501, 1993.
- [373] Hardy, P. M., Nichollas, A. C. and Rydon, H. N. The Nature of Glutaraldehyde in Aqueous Solution, *Chemical Communications*, 360:565-566, 1969.
- [374] Okamoto, K. I., Nagai, T., Miyawaki, A. and Hayashi, Y. Rapid and persistent modulation of actin dynamics regulates postsynaptic reorganization underlying bidirectional plasticity, *Nature Neuroscience*, 7(10):1104, 2004.
- [375] Wang, J., Zhu, L. H., Li, J. and Tang, H. Q. Antioxidant activity of polyaniline nanofibers, *Chinese Chemical Letters*, 18(8):1005-1008, 2007.
- [376] Gizdavic-Nikolaidis, M., Travas-Sejdic, J., Kilmartin, P. A., Bowmaker, G. A. and Cooney, R. P. Evaluation of antioxidant activity of aniline and polyaniline, *Current Applied Physics*, 4(2-4):343-346, 2004.
- [377] Ostuni, E., Chapman, R. G., Holmlin, R. E., Takayama, S. and Whitesides, G. M. A survey of structure–property relationships of surfaces that resist the adsorption of protein, *Langmuir*, 17(18):5605-5620, 2001.
- [378] Kaelble, D. H. and Moacanin, J. A surface energy analysis of bioadhesion, *Polymer*, 18(5):475-482, 1977.
- [379] Bober, P., Humpolíček, P., Pacherník, J., Stejskal, J. and Lindfors, T. Conducting polyaniline based cell culture substrate for embryonic stem cells and embryoid bodies, *RSC Advances*, 5(62):50328-50335, 2015.
- [380] Brožová, L., Holler, P., Kovářová, J., Stejskal, J. and Trchová, M. The stability of polyaniline in strongly alkaline or acidic aqueous media, *Polymer Degradation and Stability*, 93(3):592-600, 2008.
- [381] Qazi, T. H., Rai, R. and Boccaccini, A. R. Tissue engineering of electrically responsive tissues using polyaniline based polymers: A review, *Biomaterials*, 35(33):9068-9086, 2014.
- [382] Xia, Y., Lu, X. and Zhu, H. Natural silk fibroin/polyaniline (core/shell) coaxial fiber: Fabrication and application for cell proliferation, *Composites Science and Technology*, 77:37-41, 2013.

References

- [383]Thrivikraman, G., Madras, G. and Basu, B. Intermittent electrical stimuli for guidance of human mesenchymal stem cell lineage commitment towards neural-like cells on electroconductive substrates, *Biomaterials*, 35(24):6219-6235, 2014.
- [384]Bhang, S. H., Jeong, S. I., Lee, T. J., Jun, I., Lee, Y. B., Kim, B. S. and Shin, H. Electroactive Electrospun Polyaniline/Poly [(L-lactide)-co-(ϵ -caprolactone)] Fibers for Control of Neural Cell Function, *Macromolecular Bioscience*, 12(3), 402-411, 2012.
- [385]Muzzarelli, R. A. Chitins and chitosans for the repair of wounded skin, nerve, cartilage and bone, *Carbohydrate Polymers*, 76(2):167-182, 2009.
- [386]Chen, Z., Mo, X. and Qing, F. Electrospinning of collagen–chitosan complex, *Materials Letters*, 61(16):3490-3494, 2007.
- [387]Muzzarelli, R. A. Chitosan composites with inorganics, morphogenetic proteins and stem cells, for bone regeneration, *Carbohydrate Polymers*, 83(4):1433-1445, 2011.
- [388]Ayad, M. M., Salahuddin, N. A., Minisy, I. M. and Amer, W. A. Chitosan/polyaniline nanofibers coating on the quartz crystal microbalance electrode for gas sensing, *Sensors and Actuators B: Chemical*, 202:144-153, 2014.
- [389]Khan, T. A., Peh, K. K. and Ch'ng, H. S. Mechanical, bioadhesive strength and biological evaluations of chitosan films for wound dressing, *Journal of Pharmacy & Pharmaceutical Sciences*, 3(3):303-311, 2000.
- [390]Hubbell, J. A. Biomaterials in tissue engineering, *Nature Biotechnology*, 13(6):565, 1995.
- [391]Wells, R. G. The role of matrix stiffness in regulating cell behavior, *Hepatology*, 47(4):1394-1400, 2008.
- [392]Solon, J., Levental, I., Sengupta, K., Georges, P. C. and Janmey, P. A. Fibroblast adaptation and stiffness matching to soft elastic substrates, *Biophysical Journal*, 93(12):4453-4461, 2007.
- [393]Santos, E., Orive, G., Hernández, R. M. and Pedraz, J. L. Cell-biomaterial interaction: strategies to mimic the extracellular matrix. *In On Biomimetics. InTech*, 2011.
- [394]Aburto, J., Alric, I., Thiebaud, S., Borredon, E., Bikiaris, D., Prinos, J. and Panayiotou, C. Synthesis, characterization, and biodegradability of fatty-acid esters of amylose and starch, *Journal of Applied Polymer Science*, 74(6):1440-1451, 1999.

References

- [395] Potts, J. E., Clendinning, R. A., Ackart, W. B. and Niegisch, W. D. *The biodegradability of synthetic polymers*. In *Polymers and ecological problems*, Springer, Boston, MA, 1973.
- [396] Neto, C. D. T., Giacometti, J. A., Job, A. E., Ferreira, F. C., Fonseca, J. L. C. and Pereira, M. R. Thermal analysis of chitosan based networks, *Carbohydrate Polymers*, 62(2):97-103, 2005.
- [397] Lewandowska, K. Miscibility and thermal stability of poly (vinyl alcohol)/chitosan mixtures, *Thermochimica Acta*, 493(1-2):42-48, 2009.
- [398] Yavuz, A. G., Uygun, A. and Bhethanabotla, V. R. Substituted polyaniline/chitosan composites: Synthesis and characterization, *Carbohydrate Polymers*, 75(3):448-453, 2009.
- [399] Lee, J. W., Serna, F., Nickels, J. and Schmidt, C. E. Carboxylic acid-functionalized conductive polypyrrole as a bioactive platform for cell adhesion, *Biomacromolecules*, 7(6):1692-1695, 2006.
- [400] Ray, S. and Shard, A. G. Quantitative analysis of adsorbed proteins by X-ray photoelectron spectroscopy, *Analytical Chemistry*, 83(22):8659-8666, 2011.
- [401] Hersel, U., Dahmen, C. and Kessler, H. RGD modified polymers: biomaterials for stimulated cell adhesion and beyond, *Biomaterials*, 24(24):4385-4415, 2003.
- [402] Drumheller, P. D. and Hubbell, J. A. Polymer networks with grafted cell adhesion peptides for highly biospecific cell adhesive substrates, *Analytical Biochemistry*, 222(2):380-388, 1994.
- [403] Drumheller, P. D. Elbert, D. L. and Hubbell, J. A. Multifunctional poly (ethylene glycol) semi-interpenetrating polymer networks as highly selective adhesive substrates for bioadhesive peptide grafting, *Biotechnology and Bioengineering*, 43(8):772-780, 1994.
- [404] Elvira, C., Yi, F., Azevedo, M. C., Rebouta, L., Cunha, A. M., San Román, J. and Reis, R. L. Plasma-and chemical-induced graft polymerization on the surface of starch-based biomaterials aimed at improving cell adhesion and proliferation, *Journal of Materials Science: Materials in Medicine*, 14(2):187-194, 2003.
- [405] Liu, L., Chen, S., Giachelli, C. M., Ratner, B. D. and Jiang, S. Controlling osteopontin orientation on surfaces to modulate endothelial cell adhesion, *Journal of Biomedical Materials Research Part A*, 74(1):23-31, 2005.

References

- [406] Gabrovska, K., Georgieva, A., Godjevargova, T., Stoilova, O. and Manolova, N. Poly (acrylonitrile) chitosan composite membranes for urease immobilization, *Journal of Biotechnology*, 129(4):674-680, 2007.
- [407] Krajewska, B., Leszko, M. and Zaborska, W. Urease immobilized on chitosan membrane: preparation and properties, *Journal of Chemical Technology and Biotechnology*, 48(3):337-350, 1990.
- [408] Laska, J., Włodarczyk, J. and Zaborska, W. Polyaniline as a support for urease immobilization, *Journal of Molecular Catalysis B: Enzymatic*, 6(6):549-553, 1999.
- [409] Ferreira, P., Pereira, R., Coelho, J. F. J., Silva, A. F. and Gil, M. H. Modification of the biopolymer castor oil with free isocyanate groups to be applied as bioadhesive, *International Journal of Biological Macromolecules*, 40(2):144-152, 2007.
- [410] Pinto, S., Alves, P., Matos, C. M., Santos, A. C., Rodrigues, L. R., Teixeira, J. A. and Gil, M. H. Poly (dimethyl siloxane) surface modification by low pressure plasma to improve its characteristics towards biomedical applications, *Colloids and Surfaces B: Biointerfaces*, 81(1):20-26, 2010.
- [411] Bae, S. H., Che, J. H., Seo, J. M., Jeong, J., Kim, E. T., Lee, S. W., Koo, K. I., Suaning, G. J., Lovell, N. H., Kim, S. J. and Chung, H. In vitro biocompatibility of various polymer-based microelectrode arrays for retinal prosthesis, *Investigative Ophthalmology & Visual Science*, 53(6):2653-2657, 2012.
- [412] Upadhyay, J., Kumar, A., Gupta, K. and Mandal, M. Investigation of physical and biological properties of polypyrrole nanotubes–chitosan nanocomposites, *Carbohydrate Polymers*, 132:481-489, 2015.
- [413] Cheever, L. and Koshland, D. E. Retention of habituation in PC12 cells, *Proceedings of the National Academy of Sciences*, 89(21):10084-10088, 1992.
- [414] Koopmans, G., Hasse, B. and Sinis, N. The role of collagen in peripheral nerve repair, *International Review of Neurobiology*, 87:363-379, 2009.
- [415] Patel, N. and Poo, M. M. Orientation of neurite growth by extracellular electric fields, *Journal of Neuroscience*, 2(4):483-496, 1982.
- [416] Rajnicek, A. M., Robinson, K. R. and McCaig, C. D. The direction of neurite growth in a weak DC electric field depends on the substratum: contributions of adhesivity and net surface charge, *Developmental biology*, 203(2):412-423, 1998.

References

- [417] McCaig, C. D. and Zhao, M. Physiological electrical fields modify cell behaviour, *Bioessays*, 19(9):819-826, 1997.
- [418] Schmidt, C. E. and Rivers, T. J. *Biodegradable, electrically conducting polymer for tissue engineering applications*. U.S. Patent 6696575, 2004.
- [419] Panagopoulos, G. N., Megaloikononimos, P. D. and Mavrogenis, A. F. The present and future for peripheral nerve regeneration, *Orthopedics*, 40(1):e141-e156, 2017.
- [420] Grinsell, D. and Keating, C. P. Peripheral nerve reconstruction after injury: a review of clinical and experimental therapies, *Biomed Research International*, 2014, 2014.
- [421] Zhang, N., Yan, H. and Wen, X. Tissue-engineering approaches for axonal guidance, *Brain Research Reviews*, 49(1):48-64, 2005.
- [422] Ghasemi-Mobarakeh, L., Prabhakaran, M. P., Morshed, M., Nasr-Esfahani, M. H. and Ramakrishna, S. Electrospun poly (ϵ -caprolactone)/gelatin nanofibrous scaffolds for nerve tissue engineering, *Biomaterials*, 29(34):4532-4539, 2008.
- [423] Shastri, V. R., Schmidt, C. E., Langer, R. S. and Vacanti, J. P. *Neuronal stimulation using electrically conducting polymers*. U.S. Patent 6095148, 2000.
- [424] Al-Majed, A. A., Neumann, C. M., Brushart, T. M. and Gordon, T. Brief electrical stimulation promotes the speed and accuracy of motor axonal regeneration, *Journal of Neuroscience*, 20(7):2602-2608, 2000.
- [425] Schmidt, C. E. and Leach, J. B. Neural tissue engineering: strategies for repair and regeneration, *Annual Review of Biomedical Engineering*, 5(1):293-347, 2003.
- [426] Liao, S., Li, B., Ma, Z., Wei, H., Chan, C. and Ramakrishna, S. Biomimetic electrospun nanofibers for tissue regeneration, *Biomedical Materials*, 1(3):R45, 2006.
- [427] Shi, G., Zhang, Z. and Rouabhia, M. The regulation of cell functions electrically using biodegradable polypyrrole-poly lactide conductors, *Biomaterials*, 29(28):3792-3798, 2008.
- [428] Samba, R., Herrmann, T. and Zeck, G., 2015. PEDOT–CNT coated electrodes stimulate retinal neurons at low voltage amplitudes and low charge densities. *Journal of neural engineering*, 12(1), p.016014.
- [429] Rivers, T. J., Hudson, T. W. and Schmidt, C. E. Synthesis of a novel, biodegradable electrically conducting polymer for biomedical applications, *Advanced Functional Materials*, 12(1):33-37, 2002.

References

- [430] Matharu, Z., Arya, S. K., Singh, S. P., Gupta, V. and Malhotra, B. D., 2009. Langmuir–Blodgett film based on MEH-PPV for cholesterol biosensor. *Analytica Chimica Acta*, 634(2), pp.243-249.
- [431] Zhao, Q., Xin, Y., Huang, Z., Liu, S., Yang, C. and Li, Y. Using poly [2-methoxy-5-(2'-ethyl-hexyloxy)-1, 4-phenylene vinylene] as shell to fabricate the highly fluorescent nanofibers by coaxial electrospinning, *Polymer*, 48(15):4311-4315, 2007.
- [432] Cipitria, A., Skelton, A., Dargaville, T. R., Dalton, P. D. and Hutmacher, D. W. Design, fabrication and characterization of PCL electrospun scaffolds-a review, *Journal of Materials Chemistry*, 21(26):9419-9453, 2011.
- [433] Abedalwafa, M., Wang, F., Wang, L. and Li, C. Biodegradable poly-epsilon-caprolactone (PCL) for tissue engineering applications: a review, *Review on Advanced Materials Science*, 34(2):123-140, 2013.
- [434] García, A. J. Get a grip: integrins in cell-biomaterial interactions, *Biomaterials*, 26:7525-7529, 2005.
- [435] Nickels, J. D. and Schmidt, C. E. Surface modification of the conducting polymer, polypyrrole, via affinity peptide, *Journal of Biomedical Materials Research Part A*, 101(5):1464-1471, 2013.
- [436] Lee, J. H., Lee, J. W., Khang, G. and Lee, H. B. Interaction of cells on chargeable functional group gradient surfaces, *Biomaterials*, 18(4):351-358, 1997.
- [437] Arnold, K., Davies, B., Giles, R. L., Grosjean, C., Smith, G. E. and Whiting, A. To catalyze or not to catalyze? Insight into direct amide bond formation from amines and carboxylic acids under thermal and catalyzed conditions, *Advanced Synthesis & Catalysis*, 348(7-8):813-820, 2006.
- [438] Mansur, H. S., Oréfice, R. L., Vasconcelos, W. L., Lobato, Z. P. and Machado, L. J. C. Biomaterial with chemically engineered surface for protein immobilization, *Journal of Materials Science: Materials in Medicine*, 16(4):333-340, 2005.
- [439] Kusnezow, W. and Hoheisel, J. D. Solid supports for microarray immunoassays, *Journal of Molecular Recognition*, 16(4):165-176, 2003.
- [440] Zhu, M., Lerum, M. Z. and Chen, W. How to prepare reproducible, homogeneous, and hydrolytically stable aminosilane-derived layers on silica, *Langmuir*, 28(1):416-423, 2011.

References

- [441] Liang, Y., Huang, J., Zang, P., Kim, J. and Hu, W. Molecular layer deposition of APTES on silicon nanowire biosensors: Surface characterization, stability and pH response, *Applied Surface Science*, 322:202-208, 2014.
- [442] Fan, D., De Rosa, E., Murphy, M. B., Peng, Y., Smid, C. A., Chiappini, C., Liu, X., Simmons, P., Weiner, B. K., Ferrari, M. and Tasciotti, E. Mesoporous silicon-PLGA composite microspheres for the double controlled release of biomolecules for orthopedic tissue engineering, *Advanced Functional Materials*, 22(2):282-293, 2012.
- [443] Li, W. A., Lu, B. Y., Gu, L., Choi, Y., Kim, J. and Mooney, D. J. The effect of surface modification of mesoporous silica micro-rod scaffold on immune cell activation and infiltration, *Biomaterials*, 83:249-256, 2016.
- [444] Zhong, W., Li, F., Chen, L., Chen, Y. and Wei, Y. A novel approach to electrospinning of pristine and aligned MEH-PPV using binary solvents, *Journal of Materials Chemistry*, 22(12):5523-5530, 2012.
- [445] Zhao, Q., Xin, Y., Huang, Z., Liu, S., Yang, C. and Li, Y. Using poly [2-methoxy-5-(2'-ethyl-hexyloxy)-1, 4-phenylene vinylene] as shell to fabricate the highly fluorescent nanofibers by coaxial electrospinning, *Polymer*, 48(15):4311-4315, 2007.
- [446] Zargham, S., Bazgir, S., Tavakoli, A., Rashidi, A. S. and Damerchely, R. The Effect of Flow Rate on Morphology and Deposition Area of Electrospun Nylon 6 Nanofiber, *Journal of Engineered Fabrics & Fibers (JEFF)*, 7(4), 2012.
- [447] Megelski, S., Stephens, J. S., Chase, D. B. and Rabolt, J. F. Micro- and nanostructured surface morphology on electrospun polymer fibers, *Macromolecules*, 35(22):8456-8466, 2002.
- [448] Pillay, V., Dott, C., Choonara, Y. E., Tyagi, C., Tomar, L., Kumar, P., du Toit, L.C. and Ndesendo, V. M. A review of the effect of processing variables on the fabrication of electrospun nanofibers for drug delivery applications, *Journal of Nanomaterials*, 2013, 2013.
- [449] Borjigin, M., Eskridge, C., Niamat, R., Strouse, B., Bialk, P. and Kmiec, E. B. Electrospun fiber membranes enable proliferation of genetically modified cells, *International Journal of Nanomedicine*, 8:855, 2013.
- [450] Masse, M. A., Schlenoff, J. B., Karasz, F. E. and Thomas, E. L. Crystalline phases of electrically conductive poly (p-phenylene vinylene), *Journal of Polymer Science Part B: Polymer Physics*, 27(10):2045-2059, 1989.

References

- [451] Okuzaki, H. and Yan, H. *Uniaxially Aligned Poly (p-phenylene vinylene) and Carbon Nanofiber Yarns through Electrospinning of a Precursor*. In *Ferroelectrics*. InTech, 2010.
- [452] Abbassi, F., Mbarek, M., Kreher, D. and Alimi, K. Synthesis and characterization of a copolymer involving PVK and MEH-PPV for organic electronic devices, *Journal of Physics and Chemistry of Solids*, 103:142-146, 2017.
- [453] Bittiger, H., Marchessault, R. H. and Niegisch, W. D. Crystal structure of poly- ϵ -caprolactone, *Acta Crystallographica Section B: Structural Crystallography and Crystal Chemistry*, 26(12):1923-1927, 1970.
- [454] Cossiello, R. F., Akcelrud, L. and Atvars, T. D. Z. Solvent and molecular weight effects on fluorescence emission of MEH-PPV, *Journal of the Brazilian Chemical Society*, 16(1):74-86, 2005.
- [455] Chuangchote, S., Sriksirin, T. and Supaphol, P. Color Change of Electrospun Polystyrene/MEH-PPV Fibers from Orange to Yellow through Partial Decomposition of MEH Side Groups, *Macromolecular Rapid Communications*, 28(5):651-659, 2007.
- [456] Wang, H., Tao, X. and Newton, E. Thermal degradation kinetics and lifetime prediction of a luminescent conducting polymer, *Polymer International*, 53(1):20-26, 2004.
- [457] Kweon, H., Yoo, M. K., Park, I. K., Kim, T. H., Lee, H. C., Lee, H. S., Oh, J. S., Akaike, T. and Cho, C. S. A novel degradable polycaprolactone networks for tissue engineering, *Biomaterials*, 24(5):801-808, 2003.
- [458] Lampert, M. A. and Mark, P. *Current Injection in Solids*, Academic, New York, USA, 1970.
- [459] Wang, Z., Cui, Y., Wang, J., Yang, X., Wu, Y., Wang, K., Gao, X., Li, D., Li, Y., Zheng, X. L. and Zhu, Y. The effect of thick fibers and large pores of electrospun poly (ϵ -caprolactone) vascular grafts on macrophage polarization and arterial regeneration, *Biomaterials*, 35(22):5700-5710, 2014.
- [460] Milleret, V., Simona, B., Neuenschwander, P. and Hall, H. Tuning electrospinning parameters for production of 3D-fiber-fleeces with increased porosity for soft tissue engineering applications, *European Cells & Materials*, 21:286-303, 2011.
- [461] Xu, Z., Liu, Q. and Finch, J. A. Silanation and stability of 3-aminopropyl triethoxy silane on nanosized superparamagnetic particles: I. Direct silanation, *Applied Surface Science*, 120(3-4):269-278, 1997.

References

- [462] Elzein, T., Nasser-Eddine, M., Delaite, C., Bistac, S. and Dumas, P. FTIR study of polycaprolactone chain organization at interfaces, *Journal of Colloid and Interface Science*, 273(2):381-387, 2004.
- [463] Benkaddour, A., Jradi, K., Robert, S. and Daneault, C. Grafting of polycaprolactone on oxidized nanocelluloses by click chemistry, *Nanomaterials*, 3(1):141-157, 2013.
- [464] Tang, Z. G., Black, R. A., Curran, J. M., Hunt, J. A., Rhodes, N. P. and Williams, D. F. Surface properties and biocompatibility of solvent-cast poly [ϵ -caprolactone] films, *Biomaterials*, 25(19):4741-4748, 2004.
- [465] Choi, K. H., Kim, H. B., Ali, K., Sajid, M., Siddiqui, G. U., Chang, D. E., Kim, H. C., Ko, J. B., Dang, H. W. and Doh, Y. H. Hybrid surface acoustic wave-electrohydrodynamic atomization (SAW-EHDA) for the development of functional thin films, *Scientific Reports*, 5:15178, 2015.
- [466] Roque, A. P., Mercante, L. A., Scagion, V. P., Oliveira, J. E., Mattoso, L. H., Boni, L., Mendonca, C. R. and Correa, D. S. Fluorescent PMMA/MEH-PPV electrospun nanofibers: Investigation of morphology, solvent, and surfactant effect, *Journal of Polymer Science Part B: Polymer Physics*, 52(21):1388-1394, 2014.
- [467] Juhari, N., Majid, W. H. A. and Ibrahim, Z. A. Structural and optical studies of MEH-PPV using two different solvents prepared by spin coating technique, *Solid State Science and Technology*, 15(1):141-146, 2007.
- [468] Madhugiri, S., Dalton, A., Gutierrez, J., Ferraris, J. P. and Balkus, K. J. Electrospun MEH-PPV/SBA-15 composite nanofibers using a dual syringe method, *Journal of the American Chemical Society*, 125(47):14531-14538, 2003.
- [469] Scott, J. C., Kaufman, J. H., Brock, P. J., DiPietro, R., Salem, J. and Goitia, J. A. Degradation and failure of MEH-PPV light-emitting diodes, *Journal of Applied Physics*, 79(5):2745-2751, 1996.
- [470] Majoul, N., Aouida, S. and Bessaïs, B. Progress of porous silicon APTES-functionalization by FTIR investigations, *Applied Surface Science*, 331:388-391, 2015.
- [471] Atreya, M., Li, S., Kang, E.T., Neoh, K.G., Ma, Z.H., Tan, K.L. and Huang, W. Stability studies of poly (2-methoxy-5-(2'-ethyl hexyloxy)-p-(phenylene vinylene)[MEH-PPV], *Polymer Degradation and Stability*, 65(2):287-296, 1999.

References

- [472] Louette, P., Bodino, F. and Pireaux, J. J. Poly (caprolactone)(PCL) XPS reference core level and energy loss spectra, *Surface Science Spectra*, 12(1):27-31, 2005.
- [473] Yuan, S., Xiong, G., Roguin, A., Teoh, S.H. and Choong, C., *Amelioration of blood compatibility and endothelialization of polycaprolactone substrates by surface-initiated atom transfer radical polymerization*. In *Advances in biomaterials science and biomedical applications*, InTech, 2013.
- [474] Smallwood, I. *Handbook of Organic Solvent Properties*. Butterworth-Heinemann, 2012.
- [475] Ton-That, C., Phillips, M. R. and Nguyen, T. P. Blue shift in the luminescence spectra of MEH-PPV films containing ZnO nanoparticles, *Journal of Luminescence*, 128(12):2031-2034, 2008.
- [476] Asenath Smith, E. and Chen, W. How to prevent the loss of surface functionality derived from aminosilanes, *Langmuir*, 24(21):12405-12409, 2008.
- [477] Howarter, J. A. and Youngblood, J. P. Surface modification of polymers with 3-aminopropyltriethoxysilane as a general pretreatment for controlled wettability, *Macromolecules*, 40(4):1128-1132, 2007.
- [478] Bruice, P. Y. *Organic Chemistry*. 4th edition, Pearson, University of California, USA, 2004.
- [479] Hardinger, S. *Chemistry ¹⁴D Thinkbook: Organic Reactions and Pharmaceuticals*. 5th edition, Hayden McNeil, 2014.
- [480] Pires, F., Ferreira, Q., Rodrigues, C. A., Morgado, J. and Ferreira, F. C. Neural stem cell differentiation by electrical stimulation using a cross-linked PEDOT substrate: expanding the use of biocompatible conjugated conductive polymers for neural tissue engineering, *Biochimica et Biophysica Acta (BBA)-General Subjects*, 1850(6):1158-1168, 2015.
- [481] Chen, M., Patra, P. K., Warner, S. B. and Bhowmick, S. Role of fiber diameter in adhesion and proliferation of NIH 3T3 fibroblast on electrospun polycaprolactone scaffolds, *Tissue Engineering*, 13(3):579-587, 2007.
- [482] Bashur, C. A., Dahlgren, L. A. and Goldstein, A. S. Effect of fiber diameter and orientation on fibroblast morphology and proliferation on electrospun poly (D, L-lactic-co-glycolic acid) meshes, *Biomaterials*, 27(33):5681-5688, 2006.
- [483] Martin, P. T. and Koshland, D. E. The biochemistry of the neuron. Neurosecretory habituation to repetitive depolarizations in PC12 cells, *Journal of Biological Chemistry*, 266(12):7388-7392, 1991.

References

- [484]Fozdar, D. Y., Lee, J. Y., Schmidt, C. E. and Chen, S. Selective axonal growth of embryonic hippocampal neurons according to topographic features of various sizes and shapes, *International Journal of Nanomedicine*, 6:45, 2011.
- [485]Lee, J. Y., Bashur, C. A., Gomez, N., Goldstein, A. S. and Schmidt, C. E. Enhanced polarization of embryonic hippocampal neurons on micron scale electrospun fibers, *Journal of Biomedical Materials Research Part A*, 92(4):1398-1406, 2010.