References

1. Key World Energy Statistics, International Energy Agency (IEA), (2017) p.30. Archived (PDF) from the original on 20 May 2018.

2. R. Garcia, C. Pizarro, A. G. Lavin, and J. L. Bueno, "Characterization of Spanish biomass wastes for energy use," *Bioresource Technology*, 103 (2012) 249–258.

3. L. C. Rome, L. Flynn, E. M. Goldman, and T. D. Yoo, "Generating electricity while walking with loads," *Science,* 309 (2005) 1725.

4. J. M. Donelan, Q. Li, V. Naing, J. A. Hoffer, D. J. Weber, and A. D. Kuo, "Biomechanical energy harvesting: generating electricity during walking with minimal user effort," *Science,* 319 (2008) 807.

5. K. A. Cook-Chennault, N. Thambi, and A. M. Sastry, "Powering MEMS portable devices-a review of non-regenerative and regenerative power supply systems with special emphasis on piezoelectric energy harvesting systems," *Smart Materials and Structures,* 17 (2008) 043001.

6. B. L. Wardle, and S. M. Spearing, Microfabricated Power Generation Devices and Technology: Chapter 9 Structural Considerations, Weinheim: Wiley-VCH, 2009.

7. J.P. Thomas, M.A. Qidwai, and J.C. Kellogg, "Energy scavenging for small-scale unmanned systems," *Journal of Power Sources*, 159 (2006) 1494-1509.

8. J.A. Paradiso and T. Starner, "Energy scavenging for mobile and wireless electronics," *IEEE Pervasive Computing*, (1), 4 (2005) 18–27.

9. S. Roundy, R.K. Wright, and J. Rabaey, "A study of low level vibrations as a power source for wireless sensor nodes," *Computer Communications*, 26 (2003) 1131–1144.

10. P. Glynne-Jones, M.J. Tudor, S.P. Beeby, and N.M. White, "An electromagnetic, vibration powered generator for intelligent sensor systems," *Sensors and Actuators A*, 110 (2004) 344-349.

11. D. Arnold, "Review of microscale magnetic power generation", *IEEE Transaction on Magnetics*, (11) 43 (2007) 3940–3951.

12. P. Mitcheson, P. Miao, B. Start, E. Yeatman, A. Holmes, and T. Green, "MEMS electrostatic micropower generator for low frequency operation", *Sensors and Actuators A*, 115 (2004) 523-529.

13. L. Wang, and F.G. Yuan, "Vibration energy harvesting by magnetostrictive material", *Smart Materials and Structures*, (4), 17 (2008), 045009.

14. W.J. Choi, Y. Jeon, J.H. Jeong, R. Sood, and S.G. Kim, "Energy harvesting MEMS device based on thin film piezoelectric cantilevers", *Journal of Electroceramics*, 17 (2006) 543-548.

15. T. Starner, "Human-powered wearable computing", *IBM Systems Journal*, (3&4), 35 (1996) 618-629.

16. Z.L. Wang, "Toward self-powered nanosystems: From nanogenerators to nanopiezotronics", *Advance Functional Materials*, (22), 18 (2008) 3553-3567.

17. X. Wang, B. Yang, J. Liu, Y.Zhu, C. Yang, and Q. He, "A flexible triboelectric-piezoelectric hybrid nanogenerator based on P(VDF-TrFE) nanofibers and PDMS/ MWCNT for wearable devices", *Scientific Reports*, 6 (2016) 1-10.

18. Z.L. Wang, and J. Song, "Piezoelectric nanogenerators based on zinc oxide nanowire arrays", *Science,* 312 (2006) 242-245.

19. L. Gu, N. Cui, L. Cheng, Q. Xu, S. Bai, M. Yuan, W. Wu, J. Liu, Y. Zhao, F. Ma, Y. Qin, and Z.L. Wang, "Flexible Fiber Nanogenerator with 209 V Output Voltage Directly Powers a Light-Emitting Diode", *Nano Letters,* 13 (2013) 91-94.

20. R. Sankar Ganesh, S.K. Sharma, N. Abinnas, E. Durgadevi, P. Raji, S. Ponnusamy, C. Muthamizchelvan, Y. Hayakawa, and D.Y. Kim, "Fabrication of the flexible nanogenerator from BTO nanopowders on graphene coated PMMA substrates by sol-gel method", *Materials Chemistry and Physics,* 192 (2017) 274-281.

21. K.I. Park, C.K. Jeong, N.K. Kim, and K.J. Lee, "Stretchable piezoelectric nanocomposite generator", *Nano Convergence,* 3 (2016) 12.

22. Y. Qin, X. Wang, and Z. L. Wang, "Microfibre–nanowire hybrid structure for energy scavenging", *Nature*, (7180), 451(2008) 809.

23. J.H. Lee, K. Y. Lee, M. K. Gupta, T. Y. Kim, D.Y. Lee, J. Oh, C. Ryu, W. J. Yoo, C. Y. Kang, S. J. Yoon, and J. B. Yoo, "Highly stretchable piezoelectric-pyroelectric hybrid nanogenerator", *Advanced Materials*, (5), *26*(2014) 765-769.

24. W. Wu, L. Wang, Y. Li, F. Zhang, L. Lin, S. Niu, D. Chenet, X. Zhang, Y. Hao, T. F. Heinz and J. Hone, "Piezoelectricity of single-atomic-layer MoS 2 for energy conversion and piezotronics", *Nature*, (7523), 514 (2014) 470.

25. Z.L. Wang, "Nanopiezotronics", *Advanced Materials,* 19 (2007) 889-892.

26. E. Fukada, "Piezoelectricity in polymers and biological materials", *Ultrasonics*, (4), 6 (1968) 229-234.

27. E. Fukada, "Piezoelectric properties of organic polymers", Annals New York Academy of Sciences: Part I: Physical and Chemical Studies, 1974.

28. R.S. Dahiya, and M. Valle, Robotic Tactile Sensing, Springer Science+Business Media Dordrecht, 2013.

29. J. Wu, and G. Du, "Analogy between the one-dimensional acoustic waveguide and the electrical transmission line for cases with loss", *Journal of Acoustic Society of America*, (6) 100 (1996) 3973–3975

30. A. Arnau and D. Soares, "Fundamentals of Piezoelectricity", Piezoelectric Transducers and Applications, Springer, Berlin, Heidelberg, 2008, pp 1-38.

31. P. Muralt, "Ferroelectric thin films for micro-sensor and actuators: a review", *Journal of Micromechics and Microengineering*, (2), 10 (2000) 136-146.

32. S. Tadigadapa and K. Mateti, "Piezoelectric MEMS sensors: state-of-the-art and perspectives", *Measurement Science and Technology,* (9), 20 (2004) 092001.

33. Steven R. Anton, and Henry A. Sodano, "A review of power harvesting using piezoelectric materials (2003-2006)", *Smart Materials and Structures,* (3), 16 (2007) R1-R21.

34. T. Funasaka, M. Furuhata, Y. Hashimoto, and K. Nakamura, "Piezoelectric generator using a $LiNbO_3$ plate with an inverted domain", IEEE Ultrasonics Symposium Proceeding, Sendai, 1998, pp. 959-962.

35. N. Setter, D. Damjanovic, L. Eng, G. Fox, S. Gevorgian, S. Hong, A. Kingon, H. Kohlstedt, N. Y. Park, G. B. Stephenson, and I. Stolitchnov, "Ferroelectric thin films: Review of materials, properties, and applications", *Journal of applied physics,* (5), 100 (2006) 051606.

36. R. Samatham, K.J. Kim, D. Dogruer, H.R. Choi, M. Konyo, J.D. Madden, Y.Nakabo, J.-D. Nam, J. Su, S. Tadokoro, W. Yim, and M. Yamakita, Electroactive Polymers for Robotics Applications: Artificial Muscles and Sensors, K. J. Kim, S. Tadokoro (Eds.), Springer-Verlag, London, 2007.

37. J. P. Mercier, G. Zambelli, W. Kurz, Introduction to Materials Science, J. P. Mercier, G. Zambelli, W. Kurz (Eds.), Elsevier, Oxford, 2002.

38. P. Fattahi, G. Yang, G. Kim, and M. R. Abidian, “A review of organic and inorganic biomaterials for neural interfaces”, *Advanced materials*, (12), 26 (2014) 1846-1885.

39. J. Jordan, K. I. Jacob, R. Tannenbaum, M. A. Sharaf, and I. Jasiuk, “Experimental trends in polymer nanocomposites—a review”, *Materials science and engineering: A*, (1-2), 393 (2005) 1-11.

40. P. Kumari, A. Tiwari, M. Prabaharan, and S. Li, Smart polymeric materials emerging for biological applications, in: S. Li, A. Tiwari, M. Prabaharan, S.Aryal (Eds.), In Smart Polymer Materials for Biomedical Applications, NovaScience Publishers, 2011.

41. A. Kumar, A. Srivastava, I. Y. Galaev, and B. Mattiasson, “Smart polymers: physical forms and bioengineering applications”, *Progress in polymer science*, (10), 32 (2007) 1205-1237.

42. D. Roy, J. N. Cambre, and B. S. Sumerlin, “Future perspectives and recent advances in stimuli-responsive materials”, *Progress in Polymer Science*, (1-2), 35 (2010) 278-301.

43. C. L. H. Alarcón, S. Pennadam, and C. Alexander, “Stimuli responsive polymers for biomedical applications”, *Chemical Society Reviews*, (3), 34 (2005) 276-285.

44. S. Hikosaka, H. Ishikawa, and Y. Ohki, “Effects of crystallinity on dielectric properties of poly (L-lactide)”, *Electronics and Communications in Japan*, (7), 94 (2011) 1-8.

45. E. Fukada, and Y. Ando, “Piezoelectric properties of poly-β-hydroxybutyrate and copolymers of β-hydroxybutyrate and β-hydroxyvalerate”, *International Journal of Biological Macromolecules*, (6), 8 (1986) 361-366.

46. P. Martins, A. C. Lopes, and S. Lanceros-Mendez, Electroactive phases of poly(vinylidene fluoride): Determination, processing and applications”, *science*, (4), 39 (2014) 683-706.

47. P. Frübing, A. Kremmer, R. Gerhard-Multhaupt, A. Spanoudaki, and P. Pissis, “Relaxation processes at the glass transition in polyamide 11: From rigidity to viscoelasticity”, *The Journal of chemical physics*, (21), 125 (2006) 214701.

48. E. Fukada, “History and recent progress in piezoelectric polymers”, *IEEE Transactions on ultrasonics, ferroelectrics, and frequency control*, (6), 47 (2000) 1277-1290.

49. B. Ameduri, “From Vinylidene Fluoride (VDF) to the Applications of VDF-Containing Polymers and Copolymers: Recent Developments and Future Trends”, *Chemical Reviews*, 109 (2009) 6632-6686.

50. A. J. Lovinger, “Annealing of Poly(vinylidene fluoride) and Formation of a Fifth Phase”, *Macromolecules*, 15 (1982) 40-44.

51. B. Gusarov, “PVDF piezoelectric polymers : characterization and application to thermal energy harvesting”, Ph.D. Thesis, Université Grenoble Alpes, 2015.

52.https://www.fluorotherm.com/technical-information/materials-overview/pvdf-properties

53. W. Prest, Jr., and D. Luca, “The formation of the γ phase from the α and β polymorphs of polyvinylidene fluoride”, *Journal of Applied Physics*, 49 (1978) 5042–5047.

54. B. E. El Mohajir, and N. Heymans, “Changes in structural and mechanical behaviour of PVDF with processing and thermomechanical treatments. 1. Change in structure”, Polymer, 42 (2001) 5661–5667.

55. R. Gregorio Jr., and M. Cestari, “Effect of crystallization temperature on the crystalline phase content and morphology of poly(vinylidene fluoride)”, *Journal of Polymer Science Part B: Polymer Physics*, (5), 32 (1994) 859–870.

56. A. Salimi, and A. Yousefi, “Analysis method: FTIR studies of β phase crystal formation in stretched PVDF films”, *Polymer Testing*, (6) 22 (2003) 699–704.

57. H. Pan, B. Na, R. Lv, C. Li, J. Zhu, Z. Yu, “Polar phase formation in poly(vinylidene fluoride) induced by melt annealing”, *Journal of Polymer Science Part B: Polymer Physics*, (20), 50 (2012) 1433–1437.

58. B. Bera, and M. D. Sarkar, “Piezoelectricity in PVDF and PVDF Based Piezoelectric Nanogenerator: A Concept”, *IOSR Journal of Applied Physics (IOSR-JAP),* (3), 9(2017) 95-99.

59. R. Roy, R. A. Roy, and D. M. Roy, “Alternative perspectives on "quasi-crystallinity": non-uniformity and nanocomposites”, *Materials Letters,* (8-9), 4 (1986) 323-328.

60. M. Arbatti, X. Shan, and Z. Y. Cheng, “Ceramic-polymer composites with high dielectric constant”, *Advance Materials,* 19 (2007) 369-1372, 2007.

61. H. T. Lee, and L. H. Lin, “Waterborne polyurethane / clay nanocomposites: Novel effect of the clay and its interlayer ions on the morphology and physical and electrical properties”, *Macromolecules,* 39 (2006) 6133-6141.

62. X. Wang, Y. Hu, L. Song, Y. Hongyu, X. Weiyi, and H. Lu, “In situ polymerization of graphene nanosheets and polyurethane with enhanced mechanical and thermal properties”, *Journal of Materials Chemistry,* (12), 21 (2011) 4222-4227.

63. Q. Wang, and D. O’Hare, “Recent advances in the synthesis and application of layered double hydroxide (LDH) nanosheets”, *Chemical Reviews*, (7), 112 (2012) 4124-4155.

64. R. Fu, S. Chen, Y. Lin, S. Zhang, J. Jiang, Q. Li, and Y. Gu, “Improved piezoelectric properties of electrospun poly (vinylidene fluoride) fibers blended with cellulose nanocrystals”, *Materials Letters*, 187 (2017) 86-88.

65. N. B. Singh, S. Rai, S. Agarwal, “Polymer nanocomposites and Cr (VI) removal from water”, *Nanoscience Technology*, 1 (2014) 1–10.

66. C. Xu, S. Wang, and Z. L. Wang, “Nanowire Structured Hybrid Cell for Concurrently Scavenging Solar and Mechanical Energies”, *Journal of American Chemical Society,* (16), 131 (2009) 5866-5872.

67. Imec news - imec, 2008 (http://www2.imec.be/be_en/press/imec-news/imec-reports-record-power-for-micromachined-piezoelectric-energy-harvester.html).

68. G. Zhu, R. Yang, S. Wang, and Z. L. Wang, “Flexible high-output nanogenerator based on lateral ZnO nanowire array”, *Nano letters*, (8), 10 (2010) 3151-3155.

69. J. H. Jung, C. Y. Chen, B. K. Yun, N. Lee, Y. Zhou, W. Jo, C. Li-Jen, and Z. L. Wang, "Lead-free $KNbO_3$ ferroelectric nanorod based flexible nanogenerators and capacitors", *Nanotechnology*, (37), 23 (2012) 375401.

70. Z. H. Lin, Y. Yang, J. M. Wu, Y. Liu, F. Zhang, and Z. L. Wang, "$BaTiO_3$ nanotubes-based flexible and transparent nanogenerators", *The journal of physical chemistry letters*, (23), 3 (2012) 3599-3604.

71. C. K. Jeong, J. Lee, S. Han, J. Ryu, G. T. Hwang, D. Y. Park, J. H. Lee, S. S. Byun M., S. H. Ko, and K. J. Lee, "A hyper-stretchable elastic-composite energy harvester", *Advanced materials*, (18), 27 (2015) 2866-2875.

72. M. R. Joung, H. Xu, I. T. Seo, D. H. Kim, J. Hur, S. Nahm, C. Y. Kang, S. J. Yoon, and H. M. Park, "Piezoelectric nanogenerators synthesized using KNbO 3 nanowires with various crystal structures", *Journal of Materials Chemistry A*, (43), 2 (2014) 18547-18553.

73. Y. Kou, X. Chai, R. Yu, Y. Liu, and Z. Wang, "Bio-compatible BCTZ-based piezoelectric nanogenerator as energy harvester and waterdrop counter", *Ceramics International*, (9), 43 (2017) 6666-6670.

74. Y. Kou, Z. Kou, D. Zhao, Z. Wang, G. Gao, and X. Chai, "Fabrication of lead-free $Ba(Zr_{0.2}Ti_{0.8})O_3$–$(Ba_{0.7}Ca_{0.3})TiO_3$ nanoparticles and the application in flexible piezoelectric nanogenerator", *Ceramics International*, (6), 43 (2017) 4803-4806.

75. H. H. Fan, C. C. Jin, Y. Wang, H. L. Hwang, and Y. F. Zhang, "Structural of BCTZ nanowires and high performance BCTZ-based nanogenerator for biomechanical energy harvesting", *Ceramics International*, (8), 43 (2017) 5875-5880.

76. N. R. Alluri, S. Selvarajan, A. Chandrasekhar, B. Saravanakumar, G. M. Lee, J. H. Jeong, and S. J. Kim, "Worm structure piezoelectric energy harvester using ionotropic gelation of barium titanate-calcium alginate composite", *Energy*, 118 (2017) 1146-1155.

77. Z. Zhou, C. C. Bowland, M. H. Malakooti, H. Tang, and H. A. Sodano, "Lead-free $0.5Ba(Zr_{0.2}Ti_{0.8})O_3$-$0.5(Ba_{0.7}Ca_{0.3})TiO_3$ nanowires for energy harvesting", *Nanoscale*, (9), 8 (2016) 5098-5105.

78. Q. Zheng, H. Zhang, H. Mi, Z. Cai, Z. Ma, and S. Gong, "High-performance flexible piezoelectric nanogenerators consisting of porous cellulose nanofibril (CNF)/poly (dimethylsiloxane)(PDMS) aerogel films", *Nano Energy*, 26 (2016) 504-512.

79. R. Ding, H. Liu, X. Zhang, J. Xiao, R. Kishor, H. Sun, B. Zhu, G. Chen, F. Gao, X. Feng, J. Chen, “Flexible piezoelectric nanocomposite generators based on formamidinium lead halide perovskite nanoparticles”, *Advanced Functional Materials*, (42), 26 (2016) 7708-7716.

80. D. B. Deutz, N. T. Mascarenhas, J. B. J. Schelen, D. M. de Leeuw, S. van der Zwaag, and P. Groen, “Flexible Piezoelectric Touch Sensor by Alignment of Lead-Free Alkaline Niobate Microcubes in PDMS”, *Advanced Functional Materials*, (24), 27 (2017) 1700728.

81. M. M. Alam, and D. Mandal, “Native cellulose microfiber-based hybrid piezoelectric generator for mechanical energy harvesting utility”, *ACS applied materials & interfaces*, (3), 8 (2016) 1555-1558.

82. M. M. Alam, S. K. Ghosh, A. Sultana, and D. Mandal, “Lead-free $ZnSnO_3$/MWCNTs-based self-poled flexible hybrid nanogenerator for piezoelectric power generation”, *Nanotechnology*, (16), 26 (2015) 165403.

83. J. Xu, M.J. Dapino, D. Gallego-Perez, D. Hansford, “Microphone based on Polyvinylidene Fluoride (PVDF) micro-pillars and patterned electrodes”, *Sensors and Actuators A: Physical*, (1), 153 (2009) 24-32.

84. S. Bauer, F. Bauer, “Piezoelectric Polymers and Their Applications”, *Springer Series in Materials Science,*114 (2008) 157-177.

85. Y. Jiang, S. Shiono, H. Hamada, T. Fujita, K. Higuchi, and K. Maenaka, “Low-frequency energy harvesting using a laminated PVDF cantilever with a magnetic mass”, *Power MEMS*, (2010) 375378.

86. S. Li, J. Yuan, and H. Lipson, “Ambient wind energy harvesting using cross-flow fluttering”, *Journal of Applied physics*, 109 (2011) 026104.

87. C. Chang, V. H. Tran, J. Wang, Y. K. Fuh, and L. Lin, “Direct-write piezoelectric polymeric nanogenerator with high energy conversion efficiency”, *Nano letters*, (2), 10 (2010) 726-731.

88. S. K. Karan, R. Bera, S. Paria, A. K. Das, S. Maiti, A. Maitra, and B. B. Khatua, “An Approach to Design Highly Durable Piezoelectric Nanogenerator Based on Self-Poled PVDF/AlO-rGO Flexible Nanocomposite with High Power Density and Energy Conversion Efficiency”, *Advanced Energy Materials*, (20), 6 (2016) 1601016.

89. B. Mahanty, S. K. Ghosh, S. Garain, and D. Mandal, "An effective flexible wireless energy harvester/sensor based on porous electret piezoelectric polymer", *Materials Chemistry and Physics*, 186 (2017) 327-332.

90. V. K. Tiwari, A. K. Prasad, V. Singh, K. K. Jana, M. Misra, C. D. Prasad, and P. Maiti, "Nanoparticle and process induced super toughened piezoelectric hybrid materials: the effect of stretching on filled system", *Macromolecules*, (14), 46 (2013) 5595-5603.

91. J. Xue, L. Wu, N. Hu, J. Qiu, C. Chang, S. Atobe, H. Fukunaga, T. Watanabe, Y. Liu, H. Ning, and J. Li, "Evaluation of piezoelectric property of reduced graphene oxide (rGO)–poly (vinylidene fluoride) nanocomposites", *Nanoscale*, (22), 4 (2012) 7250-7255.

92. L. Wu, W. Yuan, N. Hu, Z. Wang, C. Chen, J. Qiu, J. Ying, and Y. Li, "Improved piezoelectricity of PVDF-HFP/carbon black composite films", *Journal of Physics D: Applied Physics*, (13), 47 (2014) 135302.

93. S. Garain, T. K. Sinha, P. Adhikary, K. Henkel, S. Sen, S. Ram, C. Sinha, D. Schmeißer, and D. Mandal, "Self-poled transparent and flexible UV light-emitting cerium complex–PVDF composite: a high-performance nanogenerator", *ACS applied materials & interfaces*, (2), 7 (2015) 1298-1307.

94. N. R. Alluri, A. Chandrasekhar, J. H. Jeong, and S. J. Kim, "Enhanced electroactive β-phase of the sonication-process-derived PVDF-activated carbon composite film for efficient energy conversion and a battery-free acceleration sensor", *Journal of Materials Chemistry C*, (20), 5 (2017) 4833-4844.

95. D. Dhakras, V. Borkar, S. Ogale, and J. Jog, "Enhanced piezoresponse of electrospun PVDF mats with a touch of nickel chloride hexahydrate salt", *Nanoscale*, (3), 4 (2012) 752-756.

96. K. Maity, S. Garain, K. Henkel, D. Schmeißer, and D. Mandal, "Natural Sugar-Assisted, Chemically Reinforced, Highly Durable Piezoorganic Nanogenerator with Superior Power Density for Self-Powered Wearable Electronics", *ACS applied materials & interfaces*, (50), 10 (2018) 44018-44032.

97. S. K. Ghosh, A. Biswas, S. Sen, C. Das, K. Henkel, D. Schmeisser, and D. Mandal, "Yb^{3+} assisted self-polarized PVDF based ferroelectretic nanogenerator: A facile strategy of highly efficient mechanical energy harvester fabrication", *Nano Energy*, 30 (2016) 621-629.

98. C. Kumar, A. Gaur, S. K. Rai, and P. Maiti, "Piezo devices using poly (vinylidene fluoride)/reduced graphene oxide hybrid for energy harvesting", *Nano-Structures & Nano-Objects*, 12 (2017) 174-181.

99. A. Gaur, C. Kumar, R. Shukla, and P. Maiti, "Induced piezoelectricity in poly (vinylidene fluoride) hybrid as efficient energy harvester", *ChemistrySelect*, (27), 2 (2017) 8278-8287.

100. L. Wu, Alamusi, J. Xue, T. Itoi, N. Hu, Y. Li, C. Yan, J. Qiu, H. Ning, W. Yuan, and B. Gu, "Improved energy harvesting capability of poly (vinylidene fluoride) films modified by reduced graphene oxide", *Journal of Intelligent Material Systems and Structures*, (14), 25 (2014) 1813-1824.

101. B. Saravanakumar, S. Soyoon, and S. J. Kim, "Self-powered pH sensor based on a flexible organic–inorganic hybrid composite nanogenerator", *ACS applied materials & interfaces*, (16), 6 (2014) 13716-13723.

102. S. Garain, S. Jana, T. K. Sinha, and D. Mandal, "Design of in situ poled Ce^{3+}-doped electrospun PVDF/graphene composite nanofibers for fabrication of nanopressure sensor and ultrasensitive acoustic nanogenerator", *ACS applied materials & interfaces*, (7), 8 (2016) 4532-4540.

103. Y. Xin, X. Qi, H. Tian, C. Guo, X. Li, J. Lin, and C. Wang, "Full-fiber piezoelectric sensor by straight PVDF/nanoclay nanofibers", *Materials Letters*, 164 (2016) 136-139.

104. M. M. Abolhasani, K. Shirvanimoghaddam, and M. Naebe, "PVDF/graphene composite nanofibers with enhanced piezoelectric performance for development of robust nanogenerators", *Composites Science and Technology*, 138 (2017) 49-56.

105. R. Ding, X. Zhang, G. Chen, H. Wang, R. Kishor, J. Xiao, F. Gao, K. Zeng, X. Chen, X. W. Sun, and Y. Zheng, "High-performance piezoelectric nanogenerators composed of formamidinium lead halide perovskite nanoparticles and poly (vinylidene fluoride)", *Nano Energy*, 37 (2017) 126-135.

106. C. Lee, D. Wood, D. Edmondson, D. Yao, A. E. Erickson, C. T. Tsao, R. A. Revia, H. Kim, and M. Zhang, "Electrospun uniaxially-aligned composite nanofibers as highly-efficient piezoelectric material", *Ceramics International*, (2), 42 (2016) 2734-2740.

107. Y. Mao, P. Zhao, G. McConohy, H. Yang, Y. Tong, and X. Wang, "Sponge-like piezoelectric polymer films for scalable and integratable nanogenerators and self-powered electronic systems", *Advanced Energy Materials*, (7), 4 (2014) 1301624.

108. J. Fu, Y. Hou, X. Gao, M. Zheng, and M. Zhu, "Highly durable piezoelectric energy harvester based on a PVDF flexible nanocomposite filled with oriented $BaTi_2O_5$ nanorods with high power density", *Nano Energy*, 52 (2018) 391-401.

109. D. Singh, A. Choudhary, and A. Garg, "Flexible and robust piezoelectric polymer nanocomposites based energy harvesters", *ACS applied materials & interfaces*, (3), 10 (2018) 2793-2800.

110. S. Das, A. K. Biswal, K. Parida, R. N. P. Choudhary, and A. Roy, "Electrical and mechanical behavior of PMN-PT/CNT based polymer composite film for energy harvesting", *Applied Surface Science*, 428 (2018) 356-363.

111. U. Yaqoob, A. I. Uddin, and G. S. Chung, "A novel tri-layer flexible piezoelectric nanogenerator based on surface-modified graphene and PVDF-$BaTiO_3$ nanocomposites ",*Applied Surface Science*, 405 (2017) 420-426.

112. J. Nunes-Pereira, V. Sencadas, V. Correia, V. F. Cardoso, W. Han, J. G. Rocha, and S. Lanceros-Méndez, "Energy harvesting performance of $BaTiO_3$/poly (vinylidene fluoride–trifluoroethylene) spin coated nanocomposites", *Composites Part B: Engineering*, 72 (2015) 130-136.

113. Y. Zhao, Q. Liao, G. Zhang, Z. Zhang, Q. Liang, X. Liao, and Y. Zhang, "High output piezoelectric nanocomposite generators composed of oriented BaTiO3 NPs@ PVDF", *Nano Energy*, 11 (2015) 719-727.

114. S. Siddiqui, D. I. Kim, M. T. Nguyen, S. Muhammad, W. S. Yoon, and N. E. Lee, "High-performance flexible lead-free nanocomposite piezoelectric nanogenerator for biomechanical energy harvesting and storage", *Nano Energy*, 15 (2015) 177-185

115. S. Siddiqui, D. I. Kim, E. Roh, T. Q. Trung, M. T. Nguyen, and N. E. Lee, "A durable and stable piezoelectric nanogenerator with nanocomposite nanofibers embedded in an elastomer under high loading for a self-powered sensor system", *Nano Energy*, 30 (2016) 434-442.

116. M. Choi, G. Murillo, S. Hwang, J. W. Kim, J. H. Jung, C. Y. Chen, and M. Lee, "Mechanical and electrical characterization of PVDF-ZnO hybrid structure for application to nanogenerator", *Nano Energy*, 33 (2017) 462-468.

117. B. Mahale, N. Kumar, R. Pandey, and R. Ranjan, "High Power Density Low-Lead-Piezoceramic-Polymer Composite Energy Harvester", *IEEE transactions on ultrasonics, ferroelectrics, and frequency control*, (2019).

118. S. K. Karan, D. Mandal, and B. B. Khatua, "Self-powered flexible Fe-doped RGO/PVDF nanocomposite: an excellent material for a piezoelectric energy harvester", *Nanoscale*, (24), 7 (2015) 10655-10666.

119. A. Tamang, S. K. Ghosh, S. Garain, M. M. Alam, J. Haeberle, K. Henkel, D. Schmeisser, and D. Mandal, “DNA-assisted β-phase nucleation and alignment of molecular dipoles in pvdf film: a realization of self-poled bioinspired flexible polymer nanogenerator for portable electronic devices”, *ACS applied materials & interfaces*, (30), 7 (2015) 16143-16147.

120. S. Maiti, S. K. Karan, J. Lee, A. K. Mishra, B. B. Khatua, and J. K. Kim, “Bio-waste onion skin as an innovative nature-driven piezoelectric material with high energy conversion efficiency”, *Nano energy*, 42 (2017) 282-293.

121. B. Y. Lee, J. Zhang, C. Zueger, W. J. Chung, S. Y. Yoo, E. Wang, J. Meyer, R. Ramesh, and S. W. Lee, “Virus-based piezoelectric energy generation”, *Nature nanotechnology*, (6), 7 (2012) 351.

122. S. K. Ghosh, and D. Mandal, “High-performance bio-piezoelectric nanogenerator made with fish scale”, *Applied Physics Letters*, (10), 109 (2016) 103701.

123. S. K. Ghosh, and D. Mandal, “Bio-assembled, piezoelectric prawn shell made self-powered wearable sensor for non-invasive physiological signal monitoring”, *Applied Physics Letters*, (12), 110 (2017) 123701.

124. S. K. Ghosh, and D. Mandal, “Efficient natural piezoelectric nanogenerator: electricity generation from fish swim bladder”, *Nano Energy*, 28 (2016) 356-365.

125. C. T. Pan, C. K. Yen, M. C. Hsieh, S. W. Zeng, S. W. Kuo, Y. L. Shiue, and C. H. Chien, “Energy harvester made of Taiwan local Nephila pilipes spider silk”, 19th International Conference on Solid-State Sensors, Actuators and Microsystems (TRANSDUCERS) IEEE, 2017, pp. 2220-2222.

126. D. M. Shin, H. J. Han, W. G. Kim, E. Kim, C. Kim, S. W. Hong, H. K. Kim, J. W. Oh, and Y. H. Hwang, “Bioinspired piezoelectric nanogenerators based on vertically aligned phage nanopillars”, *Energy & Environmental Science*, (11), 8 (2015) 3198-3203.

127. S. K. Karan, S. Maiti, S. Paria, A. Maitra, S. K. Si, J. K. Kim, and B. B. Khatua, “A new insight towards eggshell membrane as high energy conversion efficient bio-piezoelectric energy harvester”, *Materials today energy*, 9 (2018) 114-125.

128. S. K. Karan, S. Maiti, O. Kwon, S. Paria, A. Maitra, S. K. Si, Y. Kim, J. K. Kim, and B. B. Khatua, “Nature driven spider silk as high energy conversion efficient bio-piezoelectric nanogenerator”, *Nano energy*, 49 (2018) 655-666.

129. S. Mun, H. U. Ko, L. Zhai, S. K. Min, H. C. Kim, and J. Kim, “Enhanced electromechanical behavior of cellulose film by zinc oxide nanocoating and its vibration energy harvesting”, *Acta Materialia*, 114 (2016) 1-6.

130. C. S. Lee, J. Joo, S. Han, and S. K. Koh, “Multifunctional transducer using poly (vinylidene fluoride) active layer and highly conducting poly (3,4-ethylenedioxythiophene) electrode: actuator and generator”, *Applied Physics Letters*, (10), 85 (2004) 1841.

131. P. K. Khanna, B. Hornbostel, R. Grimme, W. Schafer, and J. Dorner, “Miniature Pressure Sensor and Micromachined Actuator Structure based on low temperature-cofired ceramics and piezoelectric material”, *Materials Chemistry and Physics*, (1), 87 (2004) 173-178.

132. Y. Huan, Y. Liu, and Y. Yang, “Simultaneous stretching and static electric field poling of poly(vinylidene fluoride-hexafluoropropylene) copolymer films”, *Polymer Engineering and Science*, (10), 47 (2007) 1630-1633.

133. X. He, K. Yao, and B. K. Gan, “Phase transition and properties of a ferroelectric poly(vinylidene fluoride-hexafluoropropylene) copolymer”, *Journal of Applied Physics*, (8), 97 (2005) 084101-084106.

134. G. Moggi, P. Bonardelli, and C. J. Bart, “Synthesis and properties of some hexafluoropropene-1,1-difluoroethene copolymers”, *Polymer Bulletin*, (2-3), 7 (1982) 115-122.

135. J. Li, S. Seok, B. Chu, F. Dogan, Q. Zhang, and Q. Wang, “Nanocomposites of ferroelectric polymers with TiO_2 nanoparticles exhibiting significantly enhanced electrical energy density”, *Advanced Materials*, (2), 21 (2009) 217-221.

136. S. Manna, and A. K. Nandi, “Piezoelectric β polymorph in poly(vinylidene fluoride)-functionalized multiwalled carbon nanotube nanocomposite films, *Journal of Physical Chemistry C*, (40), 111 (2007) 14670-14680.

137. R. A. Vaia, R. K. Teukolsky, and E. P. Giannelis, ”Interlayer Structure and Molecular Environment of Alkylammonium Layered Silicates”, *Chemistry of Materials*, (7), 6 (1994) 1017–1022.

138. V. Mittal, ”Polymer Layered Silicate Nanocomposites: A Review”, *Materials,* (3), 2 (2006) 992-1057.

139. D. Shah, P. Maiti, E. Gunn, D. F. Schmidt, D. D. Jiang, C. A. Batt, and E. P. Giannelis, "Dramatic enhancement in toughness of polyvinilidine fluoride nanocomposites via-nanoclay directed crystal structure and morphology", *Advanced Materials*, (14), 16 (2004) 1173-1177.

140. A. C. Lopes, C. M. Costa, C. J. Tavares, I. C. Neves, and S. L. Mendez, "Nucleation of the electroactive γ phase and enhancement of the optical transparency in low filler content poly(vinylidene)/clay nanocomposites", *Journal of Physical Chemistry C*, (37), 115 (2011) 18076-18082.

141.V. K. Tiwari, T. Shripathi, N. P. Lalla, and P. Maiti, "Nanoparticle induced piezoelectric, super toughened, radiation resistant, multi-functional nanohybrids", *Nanoscale*, (1), 4 (2012) 167-175.

142. R. K. Layek, S. Samanta, D. P. Chatterjee, and A. K. Nandi, "Physical and mechanical properties of poly(methyl methacrylate) -functionalized graphene/poly(-vinylidine fluoride) nanocomposites: piezoelectric β polymorph formation", *Polymer*, (24), 51 (2010) 5846-5856.

143. S. Manna, and A. K. Nandi, "Reply to "comment on 'preparation and characterization of silver-poly(vinylidene fluoride) nanocomposites: formation of piezoelectric polymorph of poly(vinylidene fluoride)", *Journal of Physical Chemistry B*, (42), 115 (2011) 12325-12326.

144. R. Gregorio, and E.M. Ueno, "Effect of crystalline phase, orientation and temperature on the dielectric properties of poly (vinylidene fluoride) (PVDF)", *Journal of Materials Science*, (18), 34 (1999) 4489-4500.

145. K. Matsushige, K. Nagata, S. Imada, and T. Takemur, "The II-I crystal transformation of poly(vinylidene fluoride) under tensile and compressional stresses", *Polymer*, 21 (1980) 1391-1397.

146. P. Maiti, and A. K. Nandi, "Morphology of poly(vinylidene fluoride)/Poly(methyl acrylate) blends: influence of chain structure", *Macromolecular Chemistry and Physics*, (8), 199 (1998) 1479-1484.

147. L. Ruan, X. Yao, Y. Chang, L. Zhou, G. Qin, and X. Zhang, "Properties and Applications of the β Phase Poly(vinylidene fluoride)", *Polymers*,10 (2018) 228.

148. A. J. Lovinger, "Ferroelectric Polymers", *Science*, 220 (1983) 1115-1121.

149. C. C. Hong, S. Y. Huang, J. Shieh, and S. H. Chen, "Enhanced Piezoelectricity of Nanoimprinted Sub- 20 nm Poly (vinylidene fluoride−trifluoroethylene) Copolymer Nanograss", *Macromolecules*, 45 (2012) 1580−1586.

150. S. K. Karan, D. Mandal, and B. B. Khatua, "Self-powered Flexible Fe-doped RGO/PVDF Nanocomposite: An Excellent Material for a Piezoelectric Energy Harvester", *Nanoscale*, 7 (2015) 10655−10666.

151. N. Maity, A. Mandal, and A. K. Nandi, "Hierarchical Nanostructured Polyaniline Functionalized Graphene/ Poly(vinylidene fluoride) Composites for Improved Dielectric Performances", *Polymer*, 103 (2016) 83−97.

152. Alamusi, J. Xue, L. Wu, N. Hu, J. Qiu, C. Chang, S. Atobe, H. Fukunaga, T. Watanabe, Y. Liu, H. Ning, J. Li, Y. Li, and Y. Zhao, "Evaluation of Piezoelectric Property of Reduced Graphene Oxide (rGO)-Poly (vinylidene fluoride) Nanocomposites", *Nanoscale*, (22), 4 (2012) 7250−7255.

153. A. Gaur, C. Kumar, R. Shukla, and P. Maiti, "Induced Piezoelectricity in Poly (vinylidene fluoride) Hybrid as Efficient Energy Harvester", *ChemistrySelect*, (27), 2 (2017) 8278−8287.

154. A. Gaur, R. Shukla, B. Kumar, A. Pal, S. Chatterji, R. Ranjan, and P. Maiti, "Processing and Nanoclay Induced Piezoelectricity in Poly(vinylidene fluoride-co-hexafluoro propylene) Nanohybrid for Device Application", *Polymer*, 97 (2016) 362−369.

155. N. Maity, A. Mandal, and A. K. Nandi, "High Dielectric Poly(vinylidene fluoride) Nanocomposite Films with MoS_2 Using Polyaniline Interlinker via Interfacial Interaction", *Journal of Materials Chemistry C*, 5 (2017) 12121−12133.

156. V. Bhavanasi, D. Y. Kusuma, and P. S. Lee, "Polarization Orientation, Piezoelectricity, and Energy Harvesting Performance of Ferroelectric PVDF-TrFE Nanotubes Synthesized by Nanoconfinement", *Advanced Energy Materials*, 4 (2014) 1400723.

157. K. K. Jana, C. Charan, V. K. Shahi, K. Mitra, B. Ray, D. Rana, and P. Maiti, "Functionalized Poly(vinylidene fluoride) Nanohybrid for Superior Fuel Cell Membrane", *Journal of Membrane Science*, 481 (2015) 124−136.

158. S. Lanceros-Mendez, J. F. Mano, A. M. Costa, and V. H. Schmidt, "FTIR and DSC Studies of Mechanically Deformed β-PVDF Films", *Journal of Macromolecular Science*, Part B, (3-4), 40 (2001) 517−527.

159. J. Kim, S. Yun, and Z. Ounaies, "Discovery of cellulose as a smart material", *Macromolecules*, (12), 39 (2006) 4202-4206.

160. J. Kim, and Y. B. Seo, "Electro-active paper actuators", *Smart Materials and Structures*, (3), 11 (2002) 355.

161. J. H. Lee, H. J. Yoon, T. Y. Kim, M. K. Gupta, J. H. Lee, W. Seung, H. Ryu, and S. W. Kim, "Micropatterned P (VDF-TrFE) film-based piezoelectric nanogenerators for highly sensitive self-powered pressure sensors", *Advanced Functional Materials*, (21), 25 (2015) 3203-3209.

162. J. C. McGrath, and I. M. Ward, "High effective draw as a route to increased stiffness and electrical response in poly (vinylidene fluoride)", *Polymer*, (8), 21 (1980) 855-857.

163. J. Scheinbeim, C. Nakafuku, B. A. Newman, and K. D. Pae, "High-pressure crystallization of poly (vinylidene fluoride)", *Journal of Applied Physics*, (6), 50 (1979) 4399-4405.

164. J. Wang, H. Li, J. Liu, Y. Duan, S. Jiang, and S. Yan, "On the $\alpha \rightarrow \beta$ transition of carbon-coated highly oriented PVDF ultrathin film induced by melt recrystallization", *Journal of the American Chemical Society*, (6), 125 (2003) 1496-1497.

165. A. J. Lovinger, "Crystallization of the β phase of poly (vinylidene fluoride) from the melt", *Polymer*, (3), 22 (1981) 412-413.

166. W. M. Prest Jr, and D. J. Luca, "The morphology and thermal response of high-temperature crystallized poly (vinylidene fluoride)", *Journal of Applied Physics*, (10), 46 (1975) 4136-4143.

167. L. Priya, and J. P. Jog, "Poly (vinylidene fluoride)/clay nanocomposites prepared by melt intercalation: Crystallization and dynamic mechanical behavior studies", *Journal of Polymer Science Part B: Polymer Physics*, (15), 40 (2002) 1682-1689.

168. L. Priya, and J. P. Jog, "Intercalated poly (vinylidene fluoride)/clay nanocomposites: structure and properties", *Journal of Polymer Science Part B: Polymer Physics*, (1), 41 (2003) 31-38.

169. D. Shah, P. Maiti, D. D. Jiang, C. A. Batt, and E. P. Giannelis, "Effect of nanoparticle mobility on toughness of polymer nanocomposites", *Advanced Materials*, (5), 17 (2005) 525-528.

170. J. Yu, P. Jiang, C. Wu, L. Wang, and X. Wu, “Graphene nanocomposites based on poly (vinylidene fluoride): structure and properties”, *Polymer Composites*, (10), 32 (2011) 1483-1491.

171. A. A. Yousefi, “Hybrid polyvinylidene fluoride/nanoclay/MWCNT nanocomposites: PVDF crystalline transformation” (2011) 725-733.

172. J. S. Lee, G. H. Kim, W. N. Kim, K. H. Oh, H. T. Kim, S. S. Hwang, and S. M. Hong, “Crystal structure and ferroelectric properties of poly (vinylidene fluoride)-carbon nano tube nanocomposite film”, *Molecular Crystals and Liquid Crystals*, (1), 491 (2008) 247-254.

173. M. H. Sun, MS thesis, North Carolina State University 2004.

174. J. Fang, X. Wang, and T. Lin, “Electrical power generator from randomly oriented electrospun poly (vinylidene fluoride) nanofibre membranes”, *Journal of Materials Chemistry*, (30), 21 (2011) 11088-11091.

175. V. Bhavanasi, V. Kumar, K. Parida, J. Wang, and P. S. Lee, “Enhanced piezoelectric energy harvesting performance of flexible PVDF-TrFE bilayer films with graphene oxide”, *ACS applied materials & interfaces*, (1), 8 (2015) 521-529.

176. K. Tashiro, M. Kobayashi, and H. Tadokoro, “Vibrational spectra and disorder-order transition of poly (vinylidene fluoride) form III”, *Macromolecules*, (6), 14 (1981) 1757-1764.

177. J. S. Hundal, and R. Nath, “The piezoelectric effect and stored polarization in corona charged ABS films”, *Journal of Physics D: Applied Physics*, (5), 31 (1998) 482.

178. P. A. Ribeiro, D. T. Balogh, and J. A. Giacometti, “Corona poling and electroactivity in a side-chain methacrylate copolymer”, *IEEE Transactions on Dielectrics and Electrical Insulation*, (4), 7 (2000) 572-577.

179. G.T. Hwang, H. Park, J. H. Lee, S. Oh, K. I. Park, M. Byun, H. Park, G. Ahn, C.K. Jeong, and K. No, “Self-powered cardiac pacemaker enabled by flexible single crystalline PMN-PT piezoelectric energy harvester”, *Advanced Materials*, 26 (2014) 4880-4887.

180. C. Kumar, A. Gaur, S. Tiwari, A. Biswas, S. K. Rai, P. Maiti, “Bio-waste polymer hybrid as induced piezoelectric material with high energy harvesting efficiency, *Composite Communication*, 11 (2019) 56-61.

181. W. Tang, J. Tian, Q. Zheng, L. Yan, J. Wang, Z. Li, and Z. L. Wang, “Implantable Self-powered Low-level Laser Cure System for Mouse Embryonic Osteoblasts’ Proliferation and Differentiation”, *ACS nano,* (8), 9 (2015) 7867-7873.

182. A. A. Gandhi, M. Wojtas, S. B. Lang, A. L. Kholkin, and S. A. Tofail, “Piezoelectricity in Poled Hydroxyapatite Ceramics”, *Journal of the American Ceramic Society,* (9), 97 (2014) 2867-2872.

183. E. Fukada, and I. Yasuda, “Piezoelectric Effects in Collagen”, *Japanese Journal of Applied Physics,* (2), 3 (1964) 117.

184. M. Minary-Jolandan, and M. F. Yu, “Nanoscale Characterization of Isolated Individual Type I Collagen Fibrils: Polarization and Piezoelectricity”, *Nanotechnology,* (8), 20 (2009) 085706.

185. J. K. Moon, and T. Shibamoto, “Antioxidant assays for plant and food components”, *Journal of Agricultural and Food Chemistry*, 57 (2009) 1655-1666.

186. M. Baláž, “Eggshell Membrane Biomaterial as a Platform for Applications in Materials Science”, *Acta biomaterialia,* (9), 10 (2014) 3827-3843.

187. K. Roth, “Boiled Eggs: Soft and Hard - Part 1”, Chemie in unserer Zeit/Wiley-VCH, copyright- Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim, 2012.

188. R. M. Leach, “Biochemistry of the organic matrix of the eggshell”, *Poultry Science*, (10), 61 (1982) 2040–2047.

189. T. Nakano, N. I. Ikawa, and L. Ozimek, “Chemical composition of chicken eggshell and shell membranes”, *Poultry Science*, 82 (2003) 510–514.

190. K. Mann, “The chicken egg white proteome”, *Proteomics*, 7 (2007) 3558–3568.

191. C. D'Ambrosio, S. Arena, A. Scaloni, L. Guerrier, E. Boschetti, M. E. Mendieta, A. Citterio, and P. G. Righetti, “Exploring the chicken egg white proteome with combinatorial peptide ligandlibraries”, *Journal of Proteome Research*, (8), 7 (2008) 3461–3474.

192. K. Kaweewong, W. Garnjanagoonchorn, W. Jirapakkul, and S. Roytrakul, “Solubilization and identification of hen eggshell membrane proteins during different times of chicken embryo development using the proteomic approach”, *The Protein Journal*, (4), 32 (2013) 297–308.

193. M. Wong, M. J. Hendrix, K. von der Mark, C. Little, and R. Stern, "Collagen in the eggshell membranes of the hen", *Developmental Biology*, (1), 104 (1984) 28–36.

194. Y. Nys, J. Gautron, J. M. Garcia-Ruiz, and M. T. Hincke, "Avian eggshell mineralization: biochemical and functional characterization of matrix proteins", *Comptes Rendus Palevol*, (6-7), 3 (2004) 549–62.

195. M. T. Hincke, Y. Nys, J. Gautron, K. Mann, A. B. Rodriguez-Navarro, M. D. McKee, "The eggshell: structure, composition and mineralization", *Front Biosci*, (1266), 17 (2012) 80.

196. D. A. Carrino, J. E. Dennis, T. M. Wu, J. L. Arias, M. S. Fernandez, J. P. Rodriguez, D. J. Fink, A. H. Heuer, and A. I. Caplan, "The avian eggshell extracellular matrix as a model for biomineralization, *Connective Tissue Research*, (1-4), 35 (1996) 325–8.

197. J. L. Arias, O. Nakamura, M. S. Fernandez, J. J. Wu, P. Knigge, D. R. Eyre, and A. I. Caplan "Role of type X collagen on experimental mineralization of eggshell membranes", *Connective Tissue Research*, (1), 36 (1997) 21–33.

198. J. L. Arias, D. J. Fink, S. Q. Xiao, A. H. Heuer, and A. I. Caplan, "Biomineralization and eggshells: cell-mediated acellular compartments of mineralized extra cellular matrix", *International Review of Cytology*, 145 (1993) 217–50.

199. B. Wu, C. Mu, G. Zhang, and W. Lin, "Effects of Cr3+ on the structure of collagen fiber", *Langmuir*, (19), 25 (2009) 11905-11910.

200. R. Bellairs, and A. Boyde, "Scanning electron microscopy of the shell membranes of the hen's egg, *Cell and Tissue Research*, (2), 96 (1969) 237–49.

201. J. W. Wong Liong, J. F. Frank, and S. Bailey, "Visualization of eggshell membranes and their interaction with Salmonella enteritidis using confocal scanning laser microscopy", *Journal of Food Protocol*, (9), 60 (1997) 1022–8.

202. J. Zhou, S. Wang, F. Nie, L. Feng, G. Zhu, and L. Jiang, "Elaborate architecture of the hierarchical hen's eggshell, *Nano Research*, (2), 4 (2010) 171–9.

203. A. Gaur, C. Kumar, S. Tiwari, and P. Maiti, "Efficient Energy Harvesting using Processed Poly (vinylidene fluoride) Nanogenerator", *ACS Applied Energy Materials,* 1 (2018) 3019-3024.

204. T. Weymuth, C. R. Jacob, and M. Reiher, "A local-mode model for understanding the dependence of the extended amide III vibrations on protein secondary structure", *Journal of Physical Chemistry B*, 114 (2010) 10649–60.

205. K. Kaiden, T. Matsui, and S. Tanaka, "A study of the amide-III band by FT-IR spectrometry of the secondary structure of albumin, myoglobin, and gammaglobulin", *Applied Spectroscopy*, (2), 41 (1987) 180-184.

206. Q. Dong, H. L. Su, D. Zhang, W. Cao, and N. Wang, "Biogenic synthesis of tubular SnO_2 with hierarchical intertextures by an aqueous technique involving glycoprotein, *Langmuir*, 23 (2007) 8108–13.

207. J. Kong, and S. Yu, "Fourier transform infrared spectroscopic analysis of protein secondary structures" *Acta biochimica et biophysica Sinica*, (8), 39 (2007) 549-559.

208. Y. H. Zhao, and Y. J. Chi, "Characterization of collagen from eggshelll membrane" *Biotechnology*, 8 (2009) 254- 258.

209. W. T. Tsai, J. M. Yang, C. W. Lai, Y. H. Cheng, C. C. Lin, and C. W. Yeh, Characterization and adsorption properties of eggshells and eggshell membrane", *Bioresource Technology*, (3), 97 (2006) 488-493.

210. S. Sun, T. Kou, and H. Zhu, "A study on bioelectret collagen", *Journal of applied polymer science*, (2), 64 (1997) 267-271.

211. S. M. Yu, "Piezoelectric Devices: Squeezed Virus Produces Electricity", *Nature nanotechnology,* (6), 7 (2012) 343.

212. L. Persano, C. Dagdeviren, C. Maruccio, L. De Lorenzis, and D. Pisignano, "Cooperativity in the Enhanced Piezoelectric Response of Polymer Nanowires", *Advanced Materials,* (45), 26 (2014) 7574-7580.

213. S. Cha, S. M. Kim, H. Kim, J. Ku, J. I. Sohn, Y. J. Park, B. G. Song, M. H. Jung, E. K. Lee, and B. L. Choi, "Porous PVDF as Effective Sonic Wave Driven Nanogenerators", *Nano letters,* (12), 11 (2011) 5142-5147.

214. R. M. Pereira, B. G. C. López, S. N. Diniz, A. A. Antunes, D. M. Garcia, C. R. Oliveira, and M. C. Marcucci, "Quantification of flavonoids in Brazilian orange peels and industrial orange juice processing wastes", *Agricultural Science*, (07), 8 (2017) 631.

215. M. H. Ahmed Abd El-ghfar, H. M. Ibrahim, I. M. Hassan, A. A. Abdel Fattah, and M. H. Mahmoud, "Peels of Lemon and Orange as Value-Added Ingredients: Chemical and Antioxidant Properties", *International Journal of Current Microbiology and Applied Science*, (12), 5 (2016) 777-794.

216. M. J. Phate, A. Kulkarni, and R. Jahagirdar, "Experimental Investigation of the Suitability of Orange Peel Oil as a Blend with Cotton Seed Oil as Alternate Fuel for Diesel Engines", *International Journal of Scientific and Research Publications*, (2015).

217. W. Miran, M. Nawaz, J. Jang, and D. S. Lee, "Conversion of orange peel waste biomass to bioelectricity using a mediator-less microbial fuel cell", *Science of the Total Environment*, 547 (2016) 197-205.

218. C. Ribeiro, V. Sencadas, D. M. Correia, and S. Lanceros-Méndez, "Piezoelectric polymers as biomaterials for tissue engineering applications", *Colloids and Surfaces B: Biointerfaces*, 136 (2015) 46-55.

219. B. Rivas, A. Torrado, P. Torre, A. Converti, and J. M. Domínguez, "Submerged citric acid fermentation on orange peel autohydrolysate" *Journal of Agricultural and Food Chemistry*, (7), 56 (2008) 2380-2387.

220. R. Bodirlau, C.A. Teaca, and I. Spiridon, "Chemical modification of beech wood: Effect on thermal stability", *BioResources,* 3 (2008) 789-800.

221. F. Xu, J. Yu, T. Tesso, F. Dowell, and D. Wang, "Qualitative and quantitative analysis of lignocellulosic biomass using infrared techniques: a mini-review", *Applied Energy*, 104 (2013) 801-809.

222. R. Miranda, D. Bustos-Martinez, C. S. Blanco, M. G. Villarreal, and M. R. Cantu, "Pyrolysis of sweet orange (Citrus sinensis) dry peel", *Journal of Analytical and Applied Pyrolysis*, (2), 86 (2009) 245-251.

223. V. Hernández-Montoya, M. Montes-Morán, and M.P. Elizalde-González, "Study of the thermal degradation of citrus seeds", *Biomass Bioenergy,* (9), 33 (2009) 1295-1299.

224. P. Champagne, and C. Li, "Enzymatic hydrolysis of cellulosic municipal wastewater treatment process residuals as feedstocks for the recovery of simple sugars", *Bioresource Technology*, (23), 100 (2009) 5700-5706.

225. B. Zapata, J. Balmaseda, E. Fregoso-Israel, and E. Torres-Garcia, "Thermo-kinetics study of orange peel in air", *Journal of Thermal Analysis and Calorimetry*, (1), 98 (2009) 309-315.

226. S. Tiwari, A. Gaur, C. Kumar and P. Maiti, "Enhanced piezoelectric response in nanoclay induced electrospun PVDF nanofibers for energy harvesting", *Energy*, 171 (2019) 485-492.

227. M. Amutio, G. Lopez, R. Aguado, M. Artetxe, J. Bilbao, and M. Olazar, "Kinetic study of lignocellulosic biomass oxidative pyrolysis", *Fuel*, 95 (2012) 305-311.

228. S. B. Lang, "Pyroelectric effect in bone and tendon", *Nature,* (5063), 212 (1966) 704.

229. E. Fukada, "Piezoelectricity as a fundamental property of wood", *Wood Science and Technology*, (4), 2 (1968) 299-307.

230. E. Fukada, "Piezoelectricity of biopolymers", *Biorheology*, 32 (1995) 593-609.

231. S. K. Devatkal, P. Jaiswal, S. N. Jha, R. Bharadwaj, K. N. Viswas, "Antibacterial activity of aqueous extract of pomegranate peel against Pseudomonas stutzeri isolated from poultry meat", *Journal of food science and technology*, (3), 50 (2013) 555-60.

232. N. S. Al-Zoreky, "Antimicrobial activity of pomegranate (*Punica granatum* L.) fruit peels", *International journal of food microbiology*, (3), 134 (2009) 244-8.

233. R. P. Singh, K. N. Chidambara Murthy, G. K. Jayaprakasha, "Studies on the antioxidant activity of pomegranate (*Punica granatum*) peel and seed extracts using *in vitro* models", *Journal of agricultural and food chemistry*, (1), 50 (2002) 81-6.

234. M. T. H. Siddiqui, S. Nizamuddin, N. M. Mubarak, K. Shirin, M. Aijaz, M. Hussain, and H. A. Baloch, "Characterization and process optimization of biochar produced using novel biomass, waste pomegranate peel: A response surface methodology approach", *Waste and Biomass Valorization*, (3), 10 (2017) 521-532.

235. S. Uçar, and S. Karagöz, "The slow pyrolysis of pomegranate seeds: The effect of temperature on the product yields and bio-oil properties", *Journal of Analytical and Applied Pyrolysis*, 84 (2009) 151–56.

236. P. D. Pathak, S. A. Mandavgane, and B. D. Kulkarni, "Valorization of pomegranate peels: A biorefinery approach", *Waste and Biomass Valorization*, (4), 8 (2017) 1127–37.

237. E. P. Lansky, and R. A. Newman, "Punica granatum (pomegranate) and its potential for prevention and treatment of inflammation and cancer", *Journal of Ethnopharmacology*, (2), 109 (2007) 177–206.

238. U. Naseem, A. Javid, F. A. Khan, K. Muhammad, and H. Arshad, "Proximate composition, minerals content, antibacterial and antifungal activity evaluation of pomegranate (Punica granatum L.) peels powder", *Middle East Journal of Scientific Research*, (3), 11 (2012) 396-401.

239. K. H. Rashid, "Electrochemical Behavior of C6. 9 Mild Steel Corrosion Inhibition in Phosphoric Acid Using Extracted Aqueous of Red Pomegranate Peels", *Association of Arab Universities Journal of Engineering Sciences*, (3), 25 (2018) 216-233.

240. M. S. Cheyad, and T. A. Salman, "Characterization and Study the Inhibition Activity of Pomegranate Peel Extract for α-Brass Corrosion in H_2SO_4 Solution", *Oriental Journal of Chemistry*, (3), 33 (2017) 1241-1251.

241. Ç. Ömeroğlu Ay, A. S. Özcan, Y. Erdoğan, and A. Özcan, "Characterization of Punica granatum L. peels and quantitatively determination of its biosorption behavior towards lead(II) ions and Acid Blue 40", *Colloids and Surfaces B: Biointerfaces,* 100 (2012) 197–204.

242. L. E. Hernandez-Mena, A. A. B. Pécora, and A. L. Beraldo, "Slow pyrolysis of bamboo biomass: Analysis of biochar properties", *Chemical Engineering Transactions,* 37 (2014) 115–120.

243. S. Ben-Ali, I. Jaouali, S. Souissi-Najar, and A. Ouederni, "Characterization and adsorption capacity of raw pomegranate peel biosorbent for copper removal", *Journal of Cleaner Production*, 142 (2017) 3809–3821.