

REFERENCES

- Abo El Ata, A.M., Attiab, S.M., Meaz, T.M. (2004). AC conductivity and dielectric behavior of $\text{CoAl}_x\text{Fe}_{2-x}\text{O}_4$. *Solid State Science*, 6, 61-69.
- Abraham, K.M. (1993). Direction in secondary lithium battery research and development. *Electrochim. Acta*, 1993, 38, 1233-1248.
- Abraham, M., Alamgir, M. and Reynolds, R.K. (1989). Polyphosphazene-Poly(Olefin Oxide) Mixed Polymer Electrolytes I. Conductivity and Thermal Studies of MEEP/PEO-(LiX)_n. *J. Electrochem. Soc.*, 136(12), 3576-3582.
- Achari, V.B., Reddy, T.J.R., Sharma, A.K. and Rao, V.V.R.N. (2007). Electrical, optical, and structural characterization of polymer blend (PVC/PMMA) electrolyte films. *Ionics*, 13, 349-354.
- Agrawal, S.L., Singh, M., Tripathi, M. Dwivedi, M.M. and Pandey, D.K. (2009). Dielectric relaxation studies on [PEO-SiO₂]:NH₄SCN nanocomposite polymer electrolyte films. *J. Mater. Sci.*, 44, 6060-6068.
- Agrawal, R.C. and Mahipal, Y.K. (2011). Study of electrical and electrochemical behaviour on hot-press synthesized nano-composite polymer electrolyte (NCPE) membranes: [(70PEO: 30 KNO₃) + x SiO₂]. *Int. J. Electrochem. Sci.*, 6, 867 - 881.
- Agrawal, S.L., Singh, M., Tripathi, M., Mauli, M. and Pandey, D.K. (2009). Dielectric relaxation studies on [PEO-SiO₂]:NH₄SCN nanocomposite polymer electrolyte films. *J. Mater. Sci.*, 44, 6060-6068.
- Ahmad, A., Rahman, M.Y.A. and Su'ait, M.S. (2008). Preparation and characterization of PVC-LiClO₄ based composite polymer electrolyte. *Physica B: Condensed Matter.*, 403, 21-22, 4128-4131.
- Ahmad, S., Bohidar, H.B., Ahmad, S. and Agnihotry, S.A. (2006). Role of fumed silica on ion conduction and rheology in nanocomposite polymeric electrolytes. *Polymer*, 47, 3583-3590.
- Akram, M., Javed, A. and Rizvi, T.Z. (2005). Dielectric Properties of Industrial Polymer Composite Materials. *Turk J Phys*, 29, 355 -362.
- Ali, A.M.M., Yahya, M.Z.A., Bahron, H., Subban, R.H.Y., Harun, M.K. and Atan, I. (2007). Impedance studies on plasticized PMMA-LiX [X: CF₃SO₃⁻, N(CF₃SO₂)₂⁻] polymer electrolytes. *Materials Letters*, 61, 2026-2029.
- Ali, A.M.M., Mohamed, N.S. and Arof, A.K. (1998). Polyethylene oxide PEO/ammonium sulfate (NH₄)₂SO₄ complexes and electrochemical cell performance. *Journal of Power Sources*, 74(1), 135-141.

References

- Alia, J.M., de Mera,Y.D., Edward, H.G.M., Garcia, F.J. and Lawson, E.E. (1997).Infrared spectroscopic study of ionic association of lithium trifluoromethanesulfonate in several solvents. *Journal of Molecular Structure*, 408/409, 439-450.
- Alias, Y. Ling, I. and Kumutha, K. (2005). Structural and Electrochemical Characteristics of 49% PMMA Grafted Polyisoprene-LiCF₃SO₃-PC Based Polymer Electrolytes. *Ionics*, 11, 414-417.
- Amir, S., Hashim-Ali S.A. and Mohamed, N.S. (2011). Studies of fractal growth patterns in poly (ethylene oxide) and chitosan membranes. *Ionics*, 17, 121-125.
- Anantha, P.S. and Hariharan, K. (2005). Physical and Ionic transport studies of Poly(ethylene oxide) - NaNO₃ polymer electrolyte system. *Solid State Ionics*, 17, 155-162.
- Angell, C.A., Fan, J., Liu, C., Lu, Q., Sanchez, E. and Xu, K.A. (1994). Li-conducting ionic rubbers for lithium battery and other applications. *Solid State Ionics*, 69, 343-353.
- Angell, C.L. (1956). The infra-red spectra and structure of ethylene carbonate. *Trans Faraday Soc.*, 52, 1178-1183.
- Appetecchi, G.B., Croce, F. and Scrosati, B. (1995). Kinetics and stability of the lithium electrode in poly(methylmethacrylate)- based gel electrolytes. *Electrochimica Acta*, 40, 8, 591-997.
- Aravindan, V. and Vickraman, P. (2007). A novel gel electrolyte with lithium difluoro(oxalato)borate salt and Sb₂O₃ nanoparticles for lithium ion batteries. *Solid State Sciences*, 9, 1069-1073.
- Aravindan, V. and Vickraman, P. (2009). Lithium fluoroalkylphosphate based novel composite polymer electrolytes (NCPE) incorporated with nanosized SiO₂ filler. *Materials Chemistry and Physics*, 115, 251-257.
- Arof, A.K., Osman, Z., Morni, N.M., Kamarulzaman, N., Ibrahim, Z.A. and Muhamad, M. R. (2001).Chitosan-based electrolyte for secondary lithium cells. *Journal of Materials Science*, 36 (3), 791-793.
- Armand, M.B., Chabagno, J. M. and Duclot, M. (1978). Ext. Abstr., Second International Meeting on Solid Electrolytes, St. Andrews, Scotland.
- Arof, A.K., Buraidah, M.H., Teo, L.P., Majid, S.R., Yahya, R. and Taha, R.M. (2010). Characterizations of chitosan-based polymer electrolyte photovoltaic cells. *International Journal of Photoenergy*. art. no. 805836.
- Awadhia, A. and Agrawal, S.L. (2007). Structural, thermal and electrical characterizations of PVA:DMSO:NH₄SCN gel electrolytes. *Solid State Ionics*, 178, 951-958.

- Aziz, N.A.N., Idris, N.K. and Isa, M.I.N. (2010a). Proton conducting polymer electrolytes of methylcellulose doped ammonium fluoride:Conductivity and ionic transport studies. *International Journal of the Physical Sciences*, 5(6), 748-752.
- Aziz, S. B., Abidin, Z. H. Z. and Arof, A.K. (2010b). Effect of silver nanoparticles on the DC conductivity in chitosan-silver triflate polymer electrolyte. *Physica B*, 405, 4429-4433.
- Bangyekan, C., Aht-Ong, D. and Srikulkit, K. (2007). Preparation and properties evaluation of chitosan-coated cassava starch films. *Carbohydrate Polymers*, 63, 61-71
- Banerjee, S. and Kumar, A. (2010). Dielectric behavior and charge transport in polyaniline nanofiber reinforced PMMA composites. *Journal of Physics and Chemistry of Solids*, 71, 381-388.
- Baran, E.J. (2008). Spectroscopic investigation of the VO²⁺/chitosan interaction. *Carbohydrates Polymers*, 74, 704-706.
- Baskaran, R., Selvasekarapandian, S., Kuwata, N., Kawamura, J. and Hattori, T. (2006). *Mater. Chem. Phys.*, 98 (2004) 55-61.
- Baskaran, R., Selvasekarapandian, S., Kuwata, N., Kawamura, J. and Hattori, T. (2007). Structure, thermal and transport properties of PVAc-LiClO₄ solid polymer electrolytes. *Journal of Physics and Chemistry of Solids*, 68, 407-412.
- Baskaran, R., Selvasekarapandian, S., Hirankumar, G. and Bhuvaneswari M.S. (2004). Dielectric and Conductivity Relaxations in PVAc Based Polymer Electrolytes. *Ionics*, 10, 129-134.
- Benedict, T. J., Banumathi, S., Veluchamy , A. Gangadharan, R., Ahamad, A. Z. and Rajendran, S. (1998). Characterization of plasticized solid polymer electrolyte by XRD and AC impedance methods. *Journal of Power Sources*, 75, 171-174.
- Berger, J., Reist, M., Mayer, J. M., Felt, O., Peppas, N. A. and Gurny, N. A. (2004). Structure and interactions in covalently and ionically crosslinked chitosan hydrogels for biomedical applications. *European Journal of Pharmaceutics and Biopharmaceutics*, 57, 19-34.
- Berth, G. and Dautzenberg, H. (2002). The degree of acetylation of chitosans and its effect on the chain conformation in aqueous solution. *Carbohydrate Polymers*, 47(1), 39-51.
- Best, A. S., Ferry, A., MacFarlane, D. R. and Forsyth, M. (1999), Conductivity in amorphous polyether nanocomposite materials, *Solid State Ionics*, 126, 269-276.
- Bhargav, P. B., Mohan, V. M., Sharma, A.K. and Rao, V. V. R. N. (2007). Structural and electrical properties of pure and NaBr doped poly (vinyl alcohol) (PVA) polymer electrolyte films for solid state battery applications. *Ionics*, 13, 441-446.
- Bhide, A. and Hariharan, K.(2007). Ionic transport studies on (PEO)₆:NaPO₃ polymer electrolyte plasticized with PEG₄₀₀. *European Polymer Journal*, 43, 4253-4270.

References

- Bishop, A. G., MacFarlane, D. R., McNaughton, D. and Forsyth, M. (1996). Triflate ion association in plasticized polymer electrolytes. *Solid State Ionics*, 85, 129-135.
- Bohnke, O., Frand, G., Rezrazi, M., Rousselot, C. and Truche, C. (1993). Fast ion transport in new lithium electrolytes gelled with PMMA. 1. Influence of polymer concentration. *Solid State Ionics*, 66(1-2), 97-104.
- Borghini, M.C., Mastragostino, M. and Zanelli, A. (1996) Reliability of lithium batteries with crosslinked polymer electrolytes. *Electrochimica Acta*, 41(15) 2369-2373.
- Borghini, M.C., Mastragostino, M., Passerini, S. and Scrosati, B. (1995). Electrochemical properties of polyethylene oxide-Li[(CF₃SO₂)₂N]- gamma LiAlO₂ composite polymer electrolytes. *J. Electrochem. Soc.*, 142(7), 2118-2121.
- Braun, D., Cherdon, H., Rehahn, M., Ritter, H. and Volt, B. (2005). Polymer synthesis: theory and practice; fundamentals, methods, experiments. Berlin, Springer Verlag.
- Brown, M.E. (2001). Introduction to Thermal Analysis: Techniques and Applications. Springer.
- Bruce, P.G. (1995). Structure and electrochemistry of polymer electrochemistry. *Electrochimica Acta*, 40, 2077-2085.
- Capuano, F., Croce, F. and Scrosati, B. (1991). Composite Polymer Electrolytes. *J. Electrochem. Soc.*, 1991, 138, 1918-1922.
- Cardenas, G. and Miranda, S.P.J. (2004). FTIR and TGA studies of chitosan composite films. *Chilean Chem Soc.*, 49, 291.
- Cervera, M.F., Heina 'ma 'ki, J., Ra 'sa 'nen, M., Maunu, S.L., Karjalainen, M., Acosta, O.M.N., Colarte, A.I. and Yliruusi, J. (2004a). Solid-state characterization of chitosans derived from lobster chitin. *Carbohydrate Polymers*, 58, 401-408.
- Cervera, M.F., Karjalainen, M., Airaksinen, S., Rantanen, J., Krogars, K., Heinämäki, J., Colarte, I., and Yliruusi, J. (2004b). Physical stability and moisture sorption of aqueous chitosan-amylase starch films plasticized with polyols. *European Journal of Pharmaceutics and Biopharmaceutics*, 58, 1, 69-76.
- Chen, H. -W., and Chang, F.-C. (2001). The novel polymer electrolyte nanocomposite composed of poly (ethylene oxide), lithium triflate and mineral clay. *Polymer*, 42, 9763-9769.
- Chiang, C.Y., Shen, Y.J., Reddy, M.J. and Chu, P.P. (2003). Structure, thermal and transport properties of PVAc-LiClO₄ solid polymer electrolytes. *J. Power Sources*, 123, 222-229.
- Chintapalli, S. and Frech, R. (1996). Effect of plasticizers on high molecular weight PEO-LiCF₃SO₃ complexes. *Solid State Ionics*, 86-88, 341-346.

References

- Choe, H.S., Giaccai, J., Alamgir, M. And Abraham, K.M(1995). Preparation and characterization poly(vinyl sulfone) and poly(vinylidenefluoride)-based electrolytes. *Electrochimica Acta*, 40, 13-14, 2289-2293.
- Croce, F., Appetecchi G.B., Persi L. and Scrosati B. (1998). Nanocomposite polymer electrolytes for lithium batteries. *Nature*, 394, 6692, 456-458.
- Croce, F., Persi, L., Ronci, F. and Scrosati, B. (2000). Nanocomposite polymer electrolytes and their impact on the lithium battery technology. *Solid State Ionics*, 135, 37-42.
- Croce, F., Sacchetti, S. and Scrosati, B. (2006). Advanced high-performance composite polymer electrolytes for lithium batteries. *Journal of Power Sources*, 161, 560-564.
- Cruickshank, J., St. A. Hubbard, H. V., Boden, N. and Ward, I. M.(1995). The role of ionic salts in determining T_g and ionic conductivity in concentrated PEG electrolyte solutions. *Polymer*, 36(19), 3779-3781.
- de Zea Bermudez , V., Alc ácer , L., Acosta, J. L. And Morales,E. (1999). Synthesis and characterization of novel urethane cross-linked ormolytes for solid-state lithium batteries. *Solid State Ionics*, 116, 197-209.
- Deepa, M., Agnihotry, S.A., Gupta, D. And Chandra, R. (2004). Ion-pairing effects and ion-solvent-polymer interactions in $\text{LiN}(\text{CF}_3\text{SO}_2)_2\text{-PC-PMMA}$ electrolytes: A FTIR study. *Electrochimica Acta*, (49)373-383.
- Deepa, M., Sharma, N. and Agnihorty, S. A. (2002). FTIR investigations on ion-ion interactionsin liquid and gel polymeric electrolytes: $\text{LiCF}_3\text{SO}_3\text{-PC-PMMA}$. *Journals of Materials Science*, 37, 1759 - 1765.
- Dias, F.B., Plomp L., Veldhuis, J.B.J. (2000). Trend in polymer electrolytes for secondary lithium batteries. *Journal of Power Sources*, 88(2), 169-191.
- Dillon, R.E.A. and Shriver, D.F. (2001). Thermal and complex impedance analysis of amorphous and crystalline lithium salt mixtures. *Solid State Ionics*, 140, 375-380.
- Ding, W., Lian, Q., Samuel, R.J. and Polk, M.B. (2003). Synthesis and characterization of a novel derivative of chitosan. *Polymer*, 44, 547-556.
- Dissanayake, M.A.K. (2004). Nano-Composite solid polymer electrolytes for solid state ionic devices. *Ionics*, 10, 221-225.
- Dissanayake, M.A.K.L. , Jayathilaka, P.A.R.D. , Bokalawala, R.S P. Albinsson, I. and Mellander, B.-E. (2003). Effect of concentration and grain size of alumina filler on the ionic conductivity enhancement of the $(\text{PEO})_9\text{LiCF}_3\text{SO}_3\text{:Al}_2\text{O}_3$ composite polymer electrolyte. *Journal of Power Sources*, 119-121, 409-414.
- Don, T-M., Chuang, C-Y. and Chiu, W-Y. (2002). Studies on the Degradation Behavior of Chitosan-g-Poly(acrylic acid) Copolymers. *Tamkang Journal of Science and Engineering*, 5(4), 235-240.

References

- Doucey, L., Revault, M., Lautie, A., Chausse, A. and Messina, R. (1999). A study of the Li/Li⁺ couple in DMC and PC solvents Part 1: Characterization of LiAsF₆/DMC and LiAsF₆/PC solutions. *Electrochimica Acta*, 44, 2371-2377.
- Dutta P., Biswas, S. and De, S.K. (2002). Dielectric relaxation of polyaniline - polyvinyl alcohol composites. *Materials Research Bulletin*, 37, 193-200.
- Erickson, M., Frech, R. and Glatzhofer, D. T. (2003). Solid polymer/salt electrolytes based on linear poly ((N-2-cyanoethyl)ethylenimine). *Electrochimica Acta*, 48, 2059-2063.
- Fan, J., Raghavan, S.R., Yu,X., Hou, J., Khan, S.A., Baker, G. L. and Fedkiw, P. S. (1998). Composite polymer electrolytes using surface-modified fumed silicas: Conductivity and rheology. *Solid State Ionics*, 111, 117 (1998).
- Fan, J. and Angell, C.A. (1995). The preparation, conductivity, viscosity and mechanical properties of polymer electrolytes and new hybrid ionic rubber electrolytes. *Electrochimica Acta*, 40(13-14), 2397-2400.
- Fenton, D.E., Parker, J.M. and Wright, P.V. (1973). Complexes of Alkali Metal Ions with PEO. *Journal of Polymer*, 14, 589.
- Forsyth, M., Meakin, P.M. and MacFarla, R. (1995). A ¹³C NMR study of the role of plasticizers in the conduction mechanism of solid polymer electrolytes. *Electrochimico Acta*, 40, 13(14), 2339 -2342.
- Frech, R. and Chintapalli, S. (1996). Effect of propylene carbonate as a plasticizer in high molecular weight PEO-LiCF₃SO₃ electrolytes. *Solid State Ionics*, 85, 61-66.
- Gabriel, C. (2006). Dielectric Properties of Biological Materials. Bioengineering and Biophysical Aspects of Electromagnetic Fields. Edited by Frank S. Barnes and Ben Greenebaum.
- Geiculescu, O. E., Yang, J., Blau, H., Bailey-Walsh, R., Creager, S. E., Pennington, W. T. and DesMartea, D. D. (2002). Solid polymer electrolytes from dilithium salts based on new bis[(perfluoroalkyl)sulfonyl]diimide dianions. Preparation and electrical characterization. *Solid State Ionics*, 148, 173-183.
- Gentili, V., Panero, S., Reale, P. and Scrosati, B. (2007). Composite gel-type polymer electrolytes for advanced, rechargeable lithium batteries. *Journal of Power Sources*, 170, 185-190.
- George, M., Nair, S.S., John, A.M., Joy, P.A. and Anantharaman, M.R. (2006). Structural, magnetic and electrical properties of the sol-gel prepared Li_{0.5}Fe_{2.5}O₄ fine particles *J. Phys. D: Appl. Phys.*, 39, 900-910.
- Glasse, M.D., Idris, R., Latham, R.J., Linford, R.G. and Schlindwein, W.S. (2002). Polymer electrolytes based on modified natural rubber. *Solid State Ionics*, 147, 3-4, 289-294.

References

- Gray, F.M. (1991). Solid Polymer Electrolytes: Fundamentals and Technological Applications, VCH, New York.
- Guibal, E. (2004). Interactions of metal ions with chitosan-based sorbents: A review. *Separation Purification Technol.*, 38, 43-74.
- Harris, W.E. and Kratochvil, B. (1981). An Introduction to Chemical Analysis. Philadelphia: Saunders.
- Hema, M., Selvasekerapandian, S., Sakunthala, A., Arunkumar, D. and Nithya, H. (2008). Structural, vibrational and electrical characterization of PVA-NH₄Br polymer electrolyte system. *Physica B*, 403, 2740-2747.
- Howell, F.S. Bose, R.A. Macedo, P.B. and Moynihan, C.T. (1974). Electrical relaxation in a Glass-Forming Molten Salt. *J. Phys. Chem.*, 78, 639-648.
- Huang, B., Wang, Z., Li, H., Huang, G., Xue, R. and Chen, L. (1996). Lithium ion conduction in polymer electrolytes based on PAN. *Solid State Ionics*, 85, 79-84.
- Huang, W., Frech, R. and Wheeler, R. A. (1994). Molecular structures and normal vibrations of trifluoromethane sulfonate (CF₃SO₃⁻) and its lithium ion pairs and aggregates. *J. Phys. Chem.*, 98 (1), 100-110.
- Huang, Y-S., Yu, S-H., Sheu, Y-R., and Huang, K-S. (2010). Preparation and thermal and anti-UV properties of chitosan/mica copolymer. *Journal of Nanomaterials*, 2010, Article ID 513798.
- Huh, P-H., Choi, M-G., Jo, N. J., Lee, J-K. and Lee, J-O. (2004). Effect of salt concentration on the glass transition temperature and ionic conductivity of poly(ethylene glycol)-polyurethane/LiClO₄ complexes. *Macromolecular Research*, 12(4), 422-426.
- Idris, R., Mohd, N.H.N. and Arjan, N.M. (2007). Preparation and characterization of the polymer electrolyte system ENR50/PVC/EC/PC/LiN(CF₃SO₂)₂ for electrochemical device applications. *Ionics*, 13, 227-230.
- Ikeda, Y., Wada, Y., Matoba Y., Murakaoni, S. and Kohjiya, S. (2000). Characterization of comb-shaped high molecular weight poly(oxy ethylene) with tri (oxy ethylene) side chains for a polymer solid electrolyte. *Electrochimica Acta*, 45, 167-1174.
- Ismail, L., Majid, S.R. and Arof, A.K. (2009). Conductivity study in PEO-LiOAc based polymer electrolyte. *Materials Research Innovations*, 13(3), 282-284.
- Itoh, T., Miyamura, Y., Iohikawa, Y., Uno, T., Kubo, M. and Yamamoto, O. J. (2003). Composite polymer electrolytes of poly(ethylene oxide)/BaTiO₃/Li salt with hyperbranched polymer. *Journal of Power Sources*, 119-121, 403-8.
- Jacob, M.M.E., Hackett, E. and Giannelis, E.P. (2003). From nanocomposite to nanogel polymer electrolytes. *J. Mater. Chem.*, 13, 1-5.

References

- Jacob, M.M.E. and Arof, A.K. (2000). FTIR studies of DMF plasticized polyvinyledene fluoride based polymer electrolytes. *Electrochimica Acta*, 45, 1701-1706.
- Jacob, M.M.E., Prabaharan, S.R.S. and Radhakrishna, S. (1997) Effect of PEO addition on the electrolytic and thermal properties of PVDF-LiClO₄ polymer electrolytes. *Solid State Ionics*, 104, 267-276.
- Jang, M-K. and J-W. Nah, Characterization and Modification of Low Molecular Water-Soluble Chitosan. *Bull. Korean Chem. Soc.*, 24(9)1303-1308.
- Jayakumar, R., Nwe, N., Tokura, S. and Tamura, H. (2007). Sulfated chitin and chitosan as novel biomaterials. *International Journal of Biological Macromolecules*, 40, 175-181.
- Kato, Y., Suwa, K., Ikuta, H., Uchimoto,Y., Wakihara, M., Yokoyama, S., Yabe, T. and Yamamoto, M. (2003). Influence of Lewis acidic borate ester groups on lithium ionic conduction in polymer electrolytes. *Journal of Material Chemistry*, 13 (2) 280-285.
- Khan, S.A., Baker, G.L. and Colson, S. (1994). Composite Polymer Electrolytes Using Fumed Silica Fillers: Rheology and Ionic Conductivity. *Chem. Mater.*, 6, 2359-2363.
- Khare, P.K. and Jain, S.K. (2000). Dielectric properties of solution-grown-undoped andacrylic-acid-doped ethyl cellulose. *Bull. Mater. Sci.*, 23(1), 17-21.
- Khiar, A.S.A., Puteh, R. and Arof, A.K. (2006). Conductivity studies of a chitosan-based polymer electrolyte. *Physica B*, 373, 23-27.
- Kim, C.S. and Oh, S.M. (2000). Importance of donor number in determining solvating ability of polymers and transport properties in gel-type polymer electrolytes. *Electrochimica Acta*, 45, 2101-2109.
- Kim, D.-W., Oh, B., Park, J.-H. and Sun Y.-K.(2000). Gel-coated membranes for lithium-ion polymer batteries.Gel-coated membranes for lithium-ion polymer batteries. *Solid State Ionics*, 138, 41-49.
- Kim, J.Y. and Kim, S.H.(1999). Ionic conduction behavior of network polymer electrolytes based on phosphate and polyether copolymers. *Solid State Ionics*, 124, 91-99.
- Kim, S., Yamaguchi, S., Elliot, J. (editorial article) (2009). Solid State Ionics in the 21st Century: Current Status and Future Prospects. *MRS Bulletin*, 34, 900-902.
- Kim, Y-T. and Smotkin, E.S. (2002). The effect of plasticizers on transport and electrochemical properties of PEO-based electrolytes for lithium rechargeable batteries. *Solid State Ionics*, 149, 29- 37.

- Kofuji, K., Qian, C.-J., Nishimura, M., Sugiyama, I., Murata, Y. and Kawashima, S. (2005). Relationship between physicochemical characteristics and functional properties of chitosan. *European Polymer Journal*, 41(11), 2784-2791.
- Koops, C.G. (1951), On the Dispersion of Resistivity and Dielectric Constant of Some Semiconductors at Audio frequencies. *Phys. Rev.*, 83, 121 - 124.
- Krajewska, B. (2005) Membrane-based processes performed with use of chitin/chitosan materials. *Separation and Purification Technology*, 41, 305-312.
- Kumar, A., Saikia, D., Singh, F. and Avasthi, D. K. (2005). Ionic conduction in 70 MeV C⁵⁺ ion-irradiated P(VDF-HFP)-(PC+DEC)-LiCF₃SO₃ gel polymer electrolyte system. *Solid State Ionics*, 176, 1585 - 1590.
- Kumar, B. and Scanlon, L.G. (2000). Composite Electrolytes for Lithium Rechargeable Batteries. *Journal of Electroceramics*, 5(2), 127-139.
- Kumar, K.V. and Sundari, G.S. (2010). Conductivity studies of (PEO +KHCO₃) solid electrolyte system. *Journal of Engineering Science and Technology*, 5(2), 130-139.
- Kumar, M. and Sekhon, S.S. (2002). Ionic conductance behaviour of plasticized polymer electrolytes containing different plasticizers. *Ionics*, 8, 223-233.
- Kumar, R., Subramania, A., Sundaram, N.T.K., Kumar, V.K. and Baskaran, I. (2007). Effect of MgO nanoparticles on ionic conductivity and electrochemical properties of nanocomposite polymer electrolyte. *Journal of Membrane Science*, 300(1-2),104-110.
- Kumutha, K. and Alias, Y. (2006). FTIR spectra of plasticized grafted natural rubber-LiCF₃SO₃ electrolytes. *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*, 64(2), 442-447.
- Kumutha, K., Alias, Y. and Said, R. (2005). FTIR and Thermal Studies of Modified Natural Rubber Based Polymer Electrolytes. *Ionics*, 11, 472-476.
- Kuila, T., Acharya, H., Srivastava, S. K., Samantaray , B.K. and Kureti, S. (2007). Enhancing the ionic conductivity of PEO based plasticized composite polymer electrolyte by LaMnO₃ nanofiller. *Materials Science and Engineering B*, 137, 217-224.
- Kweon, H.Y., Um, I.C. and Park, Y.H.(2000).Thermal behaviour of regenerated *Anthraea pernyi* silk fibroin film treated with aqueous methanol. *Polymer*, 41, 7361 - 7367.
- Laik, B., Legrand, L., Chausse, A. and Messina, R. (1998). Ion-ion interactions and lithium stability in a crosslinked PEO containing lithium salts. *Electrochimica Acta*, 44, 773-780.
- Le Tien, C., Lacroix, M., Ispas-Szabo, P., and Mateescu, M.-A. (2003). *N*-acylated chitosan: hydrophobic matrices for controlled drug release. *Journal of Controlled Release*, 93, 1- 13.

References

- Lee, K. -H., Lee, Y. -G., Park, J. -K. and Seung, D. -Y. (2000). Effect of silica on the electrochemical characteristics of the plasticized polymer electrolytes based on the P(AN-co-MMA) copolymer. *Solid State Ionics*, 133, 257-263.
- Leo, C.J., Rao, G. V. S. and Chowdari, B. V. R.(2002). Studies on plasticized PEO-lithium triflate-ceramic filler composite electrolyte system. *Solid State Ionics*, 148(1), 159-171.
- Li, Q., Sun, H.Y., Takeda,Y. , Imanishi, N. , Yang, J. and Yamamoto, O. (2001). Interface properties between a lithium metal electrode and a poly(ethylene oxide) based composite polymer electrolyte. *Journal of Power Sources*, 94, 201-205.
- Liang, Y.-H., Hung, C.-Y., Wang, C.-C. and Chen, C.-Y. (2009) Enhanced conductivity of plasticized polymer electrolytes containing chelating groups. *Journal of Power Sources*, 188, 261-267.
- Linford, R. G.(1991). In: S. Radhakrishna and A. Daud, Editors, *Solid State Materials*, Narosa Publishing House, India
- Lu, N., Ho, Y.M., Fan, C.W., Wang, F. M. and Lee, J. T. (2007). A simple method for synthesizing polymeric lithium salts exhibiting relatively high cationic transference number in solid polymer electrolytes. *Solid State Ionics*, 178(5-6), 347-353.
- Macdonald, J.R. (1987). *Impedance Spectroscopy*. Wiley, New York.
- Majid, S.R. and Arof , A.K. (2005). Proton-conducting polymer electrolyte films based on chitosan acetate complexed with NH₄NO₃ salt. *Physica B: Condensed Matter.*, 355, 78-82.
- Malathi, J., Kumaravadivel, M., Brahmanandhan, G.M., Hema, M., Baskaran, R. and Selvasekarpandian, S. (2010). Structural, thermal and electrical properties of PVA-LiCF₃SO₃ polymer electrolyte. *Journal of Non-Crystalline Solids*, 356, 2277-2281.
- Mariappan, C.R. and Govindaraj, G.(2004). Conductivity dispersion and scaling studies in Na₃M₂P₃O₁₂orthophosphate (M₂=Fe₂, TiCd, TiZn). *Physica B*, 353, 65-74.
- Meneghetti P., Qutubuddin, S. and Webber, A. (2004). Synthesis of polymer gel electrolyte with high molecular weight poly(methylmethacrylate)-clay nanocomposite. *Electrochimica Acta*, 49, 4923-4931.
- Michael, M.S., Jacob, M.M.E., Prabaharan, S.R.S. and Radhakrishna, S. (1997). Enhanced lithium ion transport in PEO-based solid polymer electrolytes employing a novel class plasticizers. *Solid State Ionics*, 98, 167-174.
- Mijovic, J. and Fitz, B.D. (1998). Dielectric Spectroscopy of Reactive Polymers, Application Note Dielectrics 2, Novocontrol GmbH.
- Mishra, R. and Rao, K.J. (1998). Electrical conductivity studies of poly(ethyleneoxide)-poly(vinylalcohol) blends. *Solid State Ionics*, 136, 113-127.

- Mishra, R.K., Mondal, S., Datt, M. and Banthia, A.K. (2010). Development and characterization of chitosan and phosphomolybdic acid (PMA) based composites. *International Journal of Plastics Technology*, 14(1), 80-92.
- Mohamed, N.S., Zakaria, M. Z., Ali, A.M.M. and Arof, A.K. (1995). Characteristics of poly (ethylene oxide)-NaI polymer electrolyte and electrochemical cell performances. *Journal of Power Sources*, 66, 169-172.
- Morni, N.M. and Arof, A.K. (1999). Chitosan- lithium triflate electrolyte in secondary lithium cells. *Journal of Power Sources*, 77(1), 42-48.
- Murata, K., Izuchi, S. and Yoshihisa, Y. (2000). An overview of the research and development of solid polymer electrolyte batteries. *Electrochimica Acta*, 45, 1501-1508.
- Murthy, T.S. and Lakshminarayana, K. (1989). Conductance studies of alkali metal acetates in acetic acid-acetonitrile mixtures. *Physics and Chemistry of Liquids: An International Journal*, 20(2-3), 167-176.
- Muzzaerelli, R. A. A. (1977). Chitin, Pergamon Press, Oxford, UK.
- Nagasubramanian, G. and Di Stefano, S. (1990). 12-Crown-4 ether-assisted enhancement of ionic conductivity and interfacial kinetics in polyethylene oxide electrolytes. *J. Electrochem. Soc.*, 137(12), 3830-3835.
- Nagasubramanian, G., Shen, D. H., Surampudi, S., Wang, Q. and Prakash, G.K.S. (1995). Lithium superacid salts for secondary lithium batteries. *Electrochimica Acta*, 40(13-14), 2277-2280.
- Narayanan, N.S.V., Ashokraj, B.V. and Sampath, S. (2009). Physicochemical, electrochemical, and spectroscopic characterization of zinc-based room-temperature molten electrolytes and their application in rechargeable batteries. *J. Electrochem. Soc.*, 156, (11), A863-A872.
- Nayak, H.C., Pandey, R.K. and Awasthi, M.C. (2011). Dielectric Properties of Solution Grown Pure and Ferrocene Doped Poly (9-Vinylcarbazole). *International Journal of Advanced Engineering & Application*, 1, 94-97.
- Neto, C.G.T., Giacometti, J.A., Job, A.E., Ferreira, F.C., Fonseca, J.L.C. and Pereira, M.R. (2005). Thermal Analysis of Chitosan Based Networks. *Carbohydrate Polymers*, 62, 97-103.
- Ng, L.S. and Mohamad, A.A. (2006). Protonic battery based on a plasticized chitosan- NH_4NO_3 solid polymer electrolyte. *Journal of Power Sources*, 163(1), 382-385.
- Nie, Q., Tan, W.B. and Zhang, Y. (2005) Synthesis and characterization of monodisperse chitosan nanoparticles with embedded quantum dots. *Nanotechnology*, 1 ,140-144.

- Niihani, T., Shimada, M., Kawamura, K., Dokko, K. Rho, Y.-H. and Kanamura, K. (2005). Synthesis of Li⁺ Ion Conductive PEO-PSt Block Copolymer Electrolyte with Microphase Separation Structure. *Electrochemical and Solid-State Letters*, 8, A385-A388.
- Niihani, T., Amaike, M., Nakano, H., Dokko, K. and Kanamura, K. (2009). Star-Shaped Polymer Electrolyte with Microphase Separation Structure for All-Solid-State Lithium Batteries. *Journal of The Electrochemical Society*, 156, A577-A583.
- Nishi, Y. (2001). Lithium ion secondary batteries; past 10 years and the future. *Journal of Power Sources*, 100, 101-106.
- Nithya, H., Selvasekarapandiana, S., Kumar, D.A., Sakunthala, A., Hema, M., Christopherselvin, P., Kawamura, P., Baskaran, R. and Sanjeeviraja, C. (2011). Thermal and dielectric studies of polymer electrolyte based on P(ECH-EO). *Materials Chemistry and Physics*, 126, 404-408.
- Niu, J., Yang, D., Sha, J.Wang, J.N. and Li, M. (2007). Infrared spectra of silicon nanowires. *Materials Letters*, 61, 894-896.
- Noda, Y., Yasuda, T. and Nishi, Y. (2004). Concept of polymer alloy electrolytes: towards room temperature operation of lithium-polymer batteries. *Electrochimica Acta*, 50, 243-246.
- Okuyama, K., Noguchi, K., Kanenari, M., Egawa, T., Osawa, K. and Ogawa, K. (2000). Structural diversity of chitosan and its complex. *Carbohydrate Polymers*, 41, pp. 237-247.
- Osman, Z. and Arof, A.K. (2003). FTIR studies of chitosan acetate based polymer electrolytes. *Electrochimica Acta*, 48, 993-999.
- Osman, Z., Ansor, N. M., Chew, K.W. and Kamarulzaman, N. (2005). Infrared and Conductivity Studies on Blends of PMMA/PEO Based Polymer Electrolytes. *Ionics*, 11, 431-435.
- Osman, Z., Ibrahim, Z. A. and Arof, A.K. (2001). Conductivity enhancement due to ion dissociation in plasticized chitosan based polymer electrolytes. *Carbohydrate Polymers*, 44, 167-173.
- Osman, Z., Isa, K. B. M., Ahmad, A. and Othman, L. (2010). A Comparative study of lithium and sodium salts in PAN-based ion conducting polymer electrolytes. *Ionics*, 16, 5, 431-435.
- Ostrovskii, D., Torell, L. M., Appetecchi, G.B. and Scrosati, B. (1998). An electrochemical and Raman spectroscopical study of gel polymer electrolytes for lithium batteries. *Solid State Ionics*, 106(1-2) 19-24.
- Pathania, D. and Singh, D. (2009). A review on electrical properties of fiber reinforced polymer composites. *International Journal of Theoretical & Applied Sciences*, 1(2), 34-37.

References

- Patsidis, A. and Psarras, G.C. (2008). Dielectric behaviour and functionality of polymer matrix - ceramic BaTiO₃ composites. *Express Polymer Letters*, 2, 10, 718-726.
- Pawlicka, A., Danczuk, M., Wieczorek, W. and Zygałdo-Monikowska, E. (2008). Influence of Plasticizer Type on the Properties of Polymer Electrolytes Based on Chitosan. *J. Phys. Chem. A*, 112, 8888-8895.
- Peniche, C., Argüelles, W. , Davidenko, N., Sastre, R. , Gallardo, A. and Román, J. S. (1999). Self-curing membranes of chitosan/PAA IPNs obtained by radical polymerization: preparation, characterization and interpolymer complexation. *Biomaterials*, 20, 1869-1878.
- Perera, K., Dissanayake, M.A.K.L. and Bandaranayake, P.W.S.K. (2000). Copper-ion conducting solid-polymer electrolytes based on polyacrylonitrile (PAN). *Electrochimica Acta*, 45, 8-9, 1361-1369.
- Periasamy, P., Tatsumi , K. , Shikano, M. , Fujieda, T. ,Sakai, T. , Saito, Y., Mizuhata, M. , Kajinami , A. and Deki, S. (1999). An electrochemical investigation on polyvinylidene fluoride-based gel polymer electrolytes. *Solid State Ionics*, 126, 285-292.
- Pitawala, H.M.J.C., Dissanayake, M.A.K.L. and Seneviratne, V.A. (2007). Combined effect of Al₂O₃ nano-fillers and EC plasticizer on ionic conductivity enhancement in the solid polymer electrolyte (PEO)_xLiTf. *Solid State Ionics*, 178, 885-888.
- Prabakar, K., Narayandass, S.A.K. and Mangalaraj, D. (2003). Dielectric and electric modulus properties of vacuum evaporated Cd_{0.8}Zn_{0.2}Te thin films. *Materials Science and Engineering*, B98, 225-231.
- Pradhan, D.K., Samantaray, B.K., Choudhary, R.N.P. and Thakur, A.K. (2005). Effect of plasticizer on structure—property relationship in composite polymer electrolytes. *J. Power Sources*, 139, 384-393.
- Pradhan, D. K., Choudhary, R.N.P. and Samantaray B. K. (2008). Studies of structural, thermal and electrical behavior of polymer nanocomposite electrolytes. *Express Polymer Letters*, 2, 630-638.
- Pradhan, D.K., Choudhary, R.N.P., Samantaray, B. K., Karan, N K. and Katiyar, R. S. (2007). Effect of Plasticizer on Structural and Electrical Properties of Polymer Nanocomposite Electrolytes. *Int. J. Electrochem. Sci.*, 2, 861-871.
- Prashanth, K.V.H., Kittur, F.S and Tharanathan, R.N.(2002). Solid state structure of chitosan prepared under different N-deacetylation conditions. *Carbohydr. Polym.*, 50, 27- 33.
- Puteh,R., Yahya, M.Z.A., Ali, A.M.M., Sulaiman, M.A. and Yahya, R. (2005). Conductivity studies on chitosan-based polymer electrolytes with lithium salts. *Indonesian Journal of Physics*, 16 (1), 17-19.

- Quartarone, E., Mustarelli, P. and Magistri, A.(1998). PEO-based composite polymer electrolytes. *Solid State Ionics*, 110(1-2), 1-14.
- Qian, X., Gu, N., Cheng, Z., Yang, X., Wang, E. and Dong, S. (2001). Impedance study of $(\text{PEO})_{10}\text{LiClO}_4\text{-Al}_2\text{O}_3$ composite polymer electrolyte with blocking electrodes. *Electrochimica Acta*, 46, 1829-1836.
- Qu, X., Wirsén, A. and Albertsson, A. -C. (2000). Effect of lactic/glycolic acid side chains on the thermal degradation kinetics of chitosan derivatives. *Polymer*, 41(13), 4841-4847.
- Rahman, M. Y.A., Salleh, M. M., Talib, I. A. and Yahaya, M. (2004). Effect of ionic conductivity of the solid polymeric electrolyte of (PVC-LiClO₄) on the performance of a solar cell of ITO/TiO₂/PVC-LiClO₄/graphite. *Journal of Power Sources*, 133(2), 293-29.
- Ragavendran, K., Kalyani, P., Veluchamy, A. , Banumathi, S., Thirunakaran, R. and Benedict, T.J. (2004). Characterization of Plasticized PEO Based Solid Polymer Electrolyte by XRD and AC Impedance Methods *Portugaliae Electrochimica Acta*, 22, 149-159.
- Raghavan, S.R., Riley, M.W., Fedkiw, P.S. and Khan, S.A.(1998). Composite polymer electrolytes based on PEG and hydrophobic silica:Rheology and structure. *Chemistry of Materials*, 10, 244
- Rajendran, S. and Uma, T. (2000), Effect of ceramic oxide on PMMA based polymer electrolyte systems. *Materials Letters*, 45, 191-196.
- Rajendran, S., Kannan, R. and Mahendran, O. (2001). AC Impedance, FTIR and XRD investigations of poly acrylonitrile complexed with LiCF₃SO₃. *Ionics*, 7, 226-229.
- Rajendran, S., Kannan, R. and Mahendran, O. (2001). Study on Li ion conduction behaviour of the plasticized polymer electrolytes based on poly acrylonitrile. *Materials Letters*, 48, 331-335.
- Rajendran, S., Mahendran, O. and Kannan, R. (2002) Ionic conductivity studies in composite solid polymer electrolytes based on methylmethacrylate. *Journal of Physics and Chemistry of Solids*, 63, 303-307.
- Rajendran, S., Shanthi Bama, V. and Prabhu, M. R. (2010). Effect of lithium salt concentration in PVAc/PMMA-based gel polymer electrolytes. *Ionics*, 16, 27-32.
- Rajendran, S., Sivakumar, M. and Subadevi, R. (2003). Effect of salt concentration in poly(vinyl alcohol)-based solid polymer electrolytes. *Journal of Power Sources*, 124, 225-230.
- Rajendran, S., Sivakumar, M. and Subadevi, R. (2004). Li-ion conduction of plasticized PVA solid polymer electrolytes complexed with various lithium salts. *Solid State Ionics*, 16, 335-339.

References

- Rajendran, S., Sivakumar, P. and Babu, R.S. (2007). Studies on the salt concentration of a PVdF-PVC based polymer blend electrolyte. *Journal of Power Sources*, 164, 815-821.
- Rajendran, S., Song, M. S., Park, M. S., Kim, J. H. and Lee, J. Y. (2005). Lithium ion conduction in PVC-LiN(CF₃SO₂)₂ electrolytes gelled with PVdF. *Materials Letters*, 59, 2347-2351.
- Rajendran, S. and Sivakumar, P. (2008). An investigation of PVdF/PVC-based blend electrolytes with EC/PC as plasticizers in lithium battery applications. *Physica B*, 403, 509-516.
- Ramesh, S., Yahaya, A.H. and Arof, A.K. (2002). Dielectric behaviour of PVC-based polymer electrolytes. *Solid State Ionics*, 152-153, 291-294.
- Ramesh, S. and Liew,C.W. (2010). Investigation on the effects of addition of SiO₂ nanoparticles on ionic conductivity, FTIR, and thermal properties of nanocomposite PMMA–LiCF₃SO₃–SiO₂. *Ionics*, 16, 255–262.
- Ramesh, S. and Ling, O.P. (2010). Effect of ethylene carbonate on the ionic conduction in poly(vinylidenefluoride-hexafluoropropylene) based solid polymer electrolytes. *Polym. Chem.*, 1, 702-707.
- Ramesh, S. and Ng, K.Y. (2009). Characterization of polymer electrolytes based on high molecular weight PVC and Li₂SO₄. *Current Applied Physics*, 9, 2, 329-332.
- Ramesh, S. and Wong, K.C. (2009). Conductivity, dielectric behaviour and thermal stability studies of lithium ion dissociation in poly(methyl methacrylate)-based gel polymer electrolytes. *Ionics*, 15, 249-254.
- Ramesh, S. and Arof, A.K. (2001). Ionic conductivity studies of plasticized poly(vinyl chloride) polymer electrolytes. *Materials Science and Engineering B*, 85, 11-15.
- Ramesh, S. and Arof, A.K. (2000). Electrical conductivity studies of polyvinyl chloride-based electrolytes with double salt system. *Solid State Ionics*, 136-137, 1197-1200.
- Ramesh, S. and Arof, A.K. (2002). Dielectric behaviour of PVC-based polymer electrolytes. *Solid State Ionics*, 152- 153, 291- 294.
- Ramesh, S. and Chai, M.F. (2007). Conductivity, dielectric behavior and FTIR studies of high molecular weight poly(vinylchloride)-lithium triflate polymer electrolytes. *Materials Science and Engineering B*, 139, 240-245.
- Ramesh, S. and Yi, L.J. (2009). Structural, thermal and conductivity studies of high molecular weight poly(vinyl chloride)-lithium triflate polymer electrolyte plasticized by dibutyl phthalate. *Ionics*, 15,725-730.
- Ramesh, S., Lee, K.H., Kumutha, K. and Arof, A.K. (2007). FTIR studies of PVC/PMMA blend based polymer electrolytes. *Spectrochimica Acta Part A*, 66, 1237-1242.

References

- Ramesh, S., Yuen, T. F. and Shen, C. J. (2008). Conductivity and FTIR studies on PEO-LiX [X: CF₃SO₃⁻, SO₄²⁻] polymer electrolytes. *Spectrochimica Acta Part A*, 69, 670-675.
- Ramya, C.S., Selvasekarapandian, S., Hirankumar, G., Savitha, T. and Angelo, P. C. (2008). Investigation on dielectric relaxations of PVP-NH₄SCN polymer electrolyte. *Journal of Non-Crystalline Solids*, 354, 1494-1502.
- Ramya, C.S., Selvasekarapandian, S., Bhuvaneswari M. S. and Savitha, T. (2006). In: Chowdari, B.V.R., Careem, M.A., Dissanayake, M.A.K.L., Rajapakse, R.M.G. and Seneviratne, V.A., Editors, Solid State Ionics-Advanced Materials for Emerging Technologies, World Scientific, Singapore, 631-638.
- Ray, D.K., Himanshu, A.K. and Sinha, T.P. (2007). Structural and low frequency dielectric of conducting polymer nanocomposites. *Indian Journal of Pure and Applied Physics*, 45, 692-699.
- Reddy, C.V.S., Han, X., Zhu, Q.-Y., Mai, L-Q. and Chen, W. (2006). Conductivity and discharge characteristics of (PVC+NaClO₄) polymer electrolyte systems. *European Polymer Journal*, 42, 3114-3120.
- Reddy, M.B. and Reddy, P.V. (1991). Low-frequency dielectric behaviour of mixed Li-Ti ferrite. *J. Phys. D: Appl. Phys.*, 24, 975-981.
- Rhazi, M., Desbrières, J., Tolaimate, A., Rinaudo, P., Vottero, P. and Alagu, A. (2002). Contribution to the study of the complexation of copper by chitosan and oligomers. *Polymer*, 43(4) 1267-1276.
- Rhodes, C.P. and Frech, R. (1999). Cation-anion and cation-polymer interactions in (PEO)_nNaCF₃SO₃(n=1-80). *Solid State Ionics*, 121, 91-99.
- Rhodes, C. P. and Frech, R. (2000). A symmetry-based analysis of Raman and infrared spectra of the compounds (poly(ethylene oxide)) LiCF₃SO₃ and (poly(ethylene oxide))NaCF₃SO₃. *Solid State Ionics*, 136-137, 1131-1137.
- Rhoo, H.-J., Kim, H.-T., Park, J.-K. and Hwang, T.-S. (1997) Ionic conduction in plasticized PVC/PMMA blend polymer electrolytes. *Electrochimica Acta*, 42(10), 1571-1579.
- Rice, M.J. and Roth, W.L. (1972). Ionic transport in super ionic conductors; a Theoretical Model. *Journal of Solid State Chemistry*, 4, 294-310.
- Rinaudo, M. (2006). Chitin and chitosan: Properties and applications. *Prog. Polym. Sci.*, 31, 603-632.
- Ritthidej G.C., Thawatchai P., Koiaumi T., Moist heat treatment on physicochemical change of chitosan salt films. *International Journal of Pharmaceutics*, 232, 11-22.
- Sakurai, K., Maegawa, T. and Takahashi, T. (2000). Glass transition temperature of chitosan and miscibility of chitosan/poly(N-vinyl pyrrolidone) blends. *Polymer*, 41, 7051-7056.

- Salleh, E., Muhamad, I.I., and Khairuddin, N. (2009). Structural Characterization and Physical Properties of Antimicrobial (AM) Starch-Based Films. *World Academy of Science, Engineering and Technology*, 55,432-440.
- Saltas, V. (2005). Dielectric spectroscopy as a tool for the detection of contamination in sandstone. 4th WSEAS Conference on Applications of Electrical Engineering, Prague, Czech Republic, 13-15 March 2005.
- Sanchez, J-Y., Allion, F., Benrabah, D. and Arnaud, R. (1997). Polymer and salt selection for lithium polymer batteries. *Journal of Power Sources*, 68, 43-51.
- Sankararamakrishnan, N. and Sanghi, R. (2006). Preparation and characterization of a novel xanthated chitosan. *Carbohydrate Polymers*, 66, 160-167.
- Sekhon, S.S. (2003) Conductivity behaviour of polymer gel electrolytes: Role of polymer. *Bull. Mater. Sci.*, 26(3), 321-328.
- Sengwa, R. J., Choudhary, S. and Sankhla, S. (2008). Low frequency dielectric relaxation processes and ionic conductivity of montmorillonite clay nanoparticles colloidal suspension in poly(vinyl pyrrolidone)-ethylene glycol blends. *Express Polymer Letters*, 2, 800-809.
- Selvasekarapandian, S. Baskaran, R. and Hema, M. (2005). Complex AC impedance, transference number and vibrational spectroscopy studies of proton conducting PVAc-NH₄SCN polymer electrolytes. *Physica B*, 357,412–419.
- Seneviratne, V., Frech, R. and Furneaux , J.E. (2003). Phases and phase transitions of P(EO)₆LiSbF₆. *Electrochimica Acta*, 48, 2221-2226.
- Sharma, A.L. and Thakur, A.K. (2010). Polymer-ion-clay interaction based model for ion conduction in intercalation-type polymer nanocomposite. *Ionics*, 16, 339-350.
- Shastry, M.C.R. and Rao K.J. (1991). Ac conductivity and dielectric relaxation studies in AgI-based fast ion conducting glasses. *Solid State Ionics*, 44, 187-198.
- Shuhaimi, N.E.A., Alias, N. A., Kufian, M. Z., Majid, S. R. and Arof, A.K. (2010a). Characteristics of methyl cellulose-NH₄NO₃-PEG electrolyte and application in fuel cells. *J. Solid State Electrochem*, 14, 2153-2159.
- Shuhaimi, N.E.A., Teo, L.P., Majid, S.R. and Arof, A.K. (2010b). Transport studies of NH₄NO₃ doped methyl cellulose electrolyte. *Synthetic Metals*,160, 1040-1044.
- Shukla,N. and Thakur, A.K. (2010). Nanocrystalline filler induced changes in electrical and stability properties of a polymer nanocomposite electrolyte based on amorphous matrix. *J. Mater. Sci.*, 45, 4236-4250.
- Slane, S. and Salomon, M. (1995). Composite gel electrolyte for rechargeable lithium batteries. *Journal of Power Sources*, 55, 1, 7-10.

References

- Singh, D.K. and Ray, A.R. (1997). Radiation-induced grafting of *N,N'*-dimethylamionethylmethacrylamide onto chitosan films, *J. Appl. Polym. Sci.*, 66, 869-877.
- Singh, R., Arora, V., Tandon, R.P., Mansingh, A. and Chandra,S. (1999). Dielectric spectroscopy of doped polyaniline. *Synthetic Metals*, 104, 2,137-144.
- Sivakumar, M., Subadevi, R., Rajendran, S., Wu, N.-L. and Lee, J.-Y. (2006). Electrochemical studies on [(1-x)PVA-xPMMA] solid polymer blend electrolytes with complexed LiBF₄. *Materials Chemistry and Physics*, 97(2-3), 330-336.
- Snyder, J.F., Ratner, M.A. and Shriver, D.F. (2002). Polymer electrolytes and polyelectrolytes: Monte Carlo simulations of thermal effects on conduction. *Solid State Ionics*, 147, 249- 257.
- Song, J.Y., Wang, Y.Y. and Wan, C.C. (1999). Review of gel-type polymer electrolytes for lithium-ion batteries. *Journal of Power Sources*, 77, 183-197.
- Souquet, J.L., Lévy, M. and Duclot, M. (1994). A single microscopic approach for ionic transport in glassy and polymer electrolytes. *Solid State Ionics*, 70/71, 337-345.
- Souquet, J.L., Duclot, M. and Levy, M. (1996) Salt-polymer complexes: strong or weak electrolytes? *Solid State Ionics*, 85, 149-157.
- Souquet, J.L., Duclot, M. and Levy, M. (1998). Ionic transport mechanisms in oxide based glasses in the supercooled and glassy states. *Solid State Ionics*, 105, 237-242.
- Souquet, J.L., Nascimento, M. L. F. and Rodrigues, A.C.N. (2010). Charge carrier concentration and mobility in alkali silicates. *The Journal of Chemical Physics*, 132, 034704(1-7).
- Souquet, J.L., Ungureanu, M.C. and Levy, M. (2004). Ionic transport mechanisms from conductivity dependence on temperature and pressure. *Journal of Non-Crystalline Solids*, 348, 78-83.
- Starkey, S.R. and Frech, R. (1997). Plasticizer interactions with polymer and salt in propylene carbonate poly(acrylonitrile)- lithium triflate. *Electrochimica Acta*, 423, 471-474.
- Stephan, A.M. and Nahm, K.S. (2006), Review on composite polymer electrolytes for lithium batteries. *Polymer*, 47, 5952-5964.
- Stephan, A.M., Renganathan, N.G., Kumar, T.P., Thirunakaran, R., Pitchumani, S., Shrisudersan, J. and Muniyandi, N. (2000). Ionic conductivity studies on plasticized PVC/PMMA blend polymer electrolyte containing LiBF₄ and LiCF₃SO₃. *Solid State Ionics*, 130, 123-132.
- Stevels, J.M. (1957). *Handbook of Physics*, Vol. 20, 350-391. Springer-Verlag, Berlin.
- Stuart, B.H. (2002). *Polymer Analysis*. John Wiley and Sons, Chichester.

- Subban, R.H.Y. and Arof, A.K. (1996). Sodium iodide added chitosan electrolyte film for polymer. *Physica Scripta*, 53, 382-384.
- Subban, R.H.Y. and Arof, A.K. (2003b). Impedance Spectroscopic Studies on a Binary Salt Poly (vinyl chloride) Based Electrolyte. *Ionics*, 9, 375-381.
- Subban, R.H.Y., Yahya, M.Z.A., Puteh, R. and Arof, A.K.(2004), Two percolations model for conductivity-salt concentration in PVC-LiPF₆ system. *Indonesian Journal of Physics*, 15(3), 51-53.
- Subban, R.H.Y. and Arof, A.K. (2003a). Experimental investigations on PVC-LiCF₃SO₃-SiO₂ composite polymer electrolytes. *Journal of New Materials for Electrochemical Systems*, 6, 197-203.
- Subban, R.H.Y., Mohamed, N.S. and Arof, A.K. (2000). Chapter 2, Electrical Characterisation of solid Electrolytes. *Electrochemical Power Sources: Materials and Characterization*. Malaysia: Arof, A.K., Mohamed, N.S., Subban, R.H.Y., Hashim Ali, S.A. & Yahya, M.Z.A.(eds). 2000. Universiti Malaya.
- Subramania, A., Sundaram, N.T.K., Kumar G.V., and Vasudevan, T. (2006). New polymer electrolyte based on (PVA-PAN) blend for Li-ion battery applications. *Ionics*, 12, 175-178.
- Sukeshini, A.M., Kulkarni, A.R. and Sharma, A. (1998). PEO based solid polymer electrolyte plasticized by dibutyl phthalate. *Solid State Ionics*, 113-115, 179-186.
- Sukeshini, A.M., Nishimoto, A. and Watanabe, M. (1996) Transport and electrochemical characterization of plasticized poly(vinyl chloride) solid electrolytes. *Solid State Ionics*, 86-88, 385-393.
- Suthanthiraraj, S A. and Paul, B.J. (2006). Electrochemica and structural properties of polyvinylidene fluoride-silver triflate solid polymer electrolyte system. In: Chowdari, B.V.R. ,Careem, M.A., Dissanayake, M.A.K.L. , Rajapakse, R.M.G. and Seneviratne, V.A. Editors, *Solid State Ionics-Advanced Materials for Emerging Technologies*, World Scientific, Singapore,639-646.
- Suthanthiraraj, S.A., Sheeba, D.J. and Paul, B.J. (2009). Impact of ethylene carbonate on ion transport characteristics of PVdF-AgCF₃SO₃ polymer electrolyte system. *Materials Research Bulletin*, 44, 1534-1539.
- Tanaka, R., Sakurai, M., Sekiguchi, H., Mori, H., Murayama, T. and Ooyama, T. (2001). Lithium ion conductivity in polyoxyethylene:polyethylenimine blends. *Electrochimica Acta*, 46, 1709-1715.
- Thokchom J.S., Chen, C., Abraham, K.M. and Kumar, B. (2005). High conductivity electrolytes in the PEO_x:LiN(SO₂CF₂CF₃)₂-Al₂O₃ system. *Solid State Ionics*, 176, 1887 - 1893.
- Tominaga, Y., Takizawa, N., and Ohno, H. (2000). Effect of added salt species on the ionic conductivity of PEO:sulfonamide salt hybrids. *Electrochimica Acta* , 45, 1285-1289.

References

- Tiwari, A. and Singh, V. (2007). Synthesis and characterization of electrical conducting chitosan-graftpolyaniline. *Express Polymer Letters*, 1, 308-317.
- Twu, Y.-K., Chang, I.-T. and Ping, C. C. (2005). Preparation of novel chitosan scaffolds by electrochemical process. *Carbohydrate Polymers*, 62, 113-119.
- Uma, T., Mahalingam, T. and Stimming, U. (2004). Conductivity and thermal studies of solid polymer electrolytes prepared by blending polyvinylchloride, polymethylmethacrylate and lithium sulfate. *Materials Chemistry and Physics*, 85, 1, 131-136.
- Uma, T., Mahalingam, T. and Stimming, U. (2005). Conductivity studies on poly (methyl methacrylate)-Li₂SO₄ polymer electrolyte systems. *Materials Chemistry and Physics*, 90, 245-249.
- Velazquez-Morales, P., Le Nest, J.-F. and Gandini, A. (1998). Polymer electrolytes derived from chitosan /polyether networks. *Electrochimica Acta*, 43 (10-11), 1275-1279.
- Vieira, D.F. Avellaneda, C.O. and Pawlicka, A. (2007). Conductivity study of a gelatin-based polymer electrolyte. *Electrochimica Acta*, 53, 1404-1408.
- Wang, B., Li, S.Q. and Wang, S.J. (1997). Correlation between the segmental motion and ionic conductivity of poly(ether urethane)-LiClO₄ complex studied by positron spectroscopy. *Phys. Rev. B*, 56, 11503 - 11507.
- Wang, Z., Huang, B., Huang, H., Xue, R., Chen, L. and Wang, F. (1996). Infrared spectroscopic study of the interaction between lithium salt LiClO₄ and the plasticizer ethylene carbonate in the polyacrylonitrile-based electrolyte. *Solid State Ionics*, 85(1-4), 143-148.
- Watanabe, M. and Mizumara, T. (1996) Conductivity study on ionic liquid/polymer complexes. *Solid State Ionics*, 86-88, 353-356.
- Watanabe, M., Tokuda, H. and Muto, S. (2001). Anionic effect on ion transport properties in network polyether electrolytes. *Electrochimica Acta*, 46, 1487-1491.
- Wan, Y., Creber, K.A.M., Peppley, B. and Tam Bui, V. (2003). Ionic conductivity of chitosan membranes. *Polymer*, 44(4), 1057-1065.
- Weston, S. and Steele, B.C.H. (1982). Effects of inert fillers on the mechanical and electrochemical properties of lithium salt-poly(ethylene oxide) polymer electrolytes. *Solid State Ionics*, 7, 75-79.
- Wieczorek, W., Steven, J. R. and Florjahczyk, Z. (1996). Composite polyether based solid electrolytes. The Lewis acid-base approach. *Solid State Ionics*, 85, 67-72.
- Winie, T. and Arof, A.K. (2004). Dielectric behaviour and AC conductivity of LiCF₃SO₃ doped H-chitosan polymer films. *Ionics*, 10 (3-4), 193-199.

References

- Winie, T. and Arof, A.K. (2006a). Effect of Various Plasticizers on the Transport Properties of Hexanoyl Chitosan-Based Polymer Electrolyte. *Journal of Applied Polymer Science*, 101, 4474-4479.
- Winie, T. and Arof, A.K. (2006b). FT-IR studies on interactions among components in hexanoyl chitosan-based polymer electrolytes. *Spectrochimica Acta Part A*, 63, 677-684.
- Winie, T., Majid, S.R., Khiar, A. S. A and Arof, A.K. (2006). Characterization of plasticized hexanoyl chitosan-based polymer electrolytes and application in LiCoO₂/MCMB cells. *Materials Science Forum*, 517, 85-88.
- Yadav, V. S., Sahu, D. K., Singh, Y. and Dhubkarya, D.C. (2010). The Effect of Frequency and Temperature on Dielectric Properties of Pure Poly Vinylidene Fluoride (PVDF) Thin Films. Proceedings of the International MultiConference of Engineers and Computer Scientists 2010 Vol III, IMECS 2010, Hong Kong.
- Yahya, M.Z.A. , Puteh, R. and Arof, A.K. (2004). Electrical Properties of Fatty Acid in Salted Chitosan Membranes. *Indonesian Journal of Physics*, 15(4), 77-82.
- Yahya, M.Z.A. and Arof, A.K. (2003). Effect of oleic acid plasticizer on chitosan-lithium acetate solid polymer electrolytes. *European Polymer Journal*, 39, 897-902.
- Yahya, M.Z.A. and Arof, A.K. (2002) Studies on lithium acetate doped chitosan conducting polymer system. *European Polymer Journal*, 38(6), 1191-1197.
- Yahya, M.Z.A., Ali, A.M.M., Mohammad, M. F., Hanafiah, M.A.K.M., Mustaffa, M., Ibrahim, S. C., Darus, Z. M. and Harun, M.K. (2006). Ionic conduction model in salted chitosan membranes plasticized with fatty acid. *Journal of Applied Sciences*, 6(6), 1287-1291.
- Yahya, M.Z.A., Puteh, R. and Arof, A.K. (2005). Solid Ionic Conductors Based on Salted Chitosan - Fatty Acid Plasticizer Systems. *Materials Science Forum*, 480-481, 95-100.
- Yamamoto, T., Inami, M. and Kanbara T. (1994). Preparation and properties of polymer solid electrolytes using poly(vinyl alcohol) and thermally resistive poly[arylene(1,3-imidazolidine-2,4,5-trione-1,3-diyl)] as matrix polymers. *Chemistry of Materials*, 6 (1), 44-50.
- Yang, X.Q., Lee, H.S., Hanson, L., McBreen, J. and Okamoto, Y. (1995). Development of a new plasticizer for poly(ethylene oxide)-based polymer electrolyte and the investigation of their ion-pair dissociation effect. *Journal of Power Sources*, 54(2), 198-204.
- Yue, Z., McEwen, I.J. and Cowie, J.M.G. (2003). Novel gel polymer electrolytes based on a cellulose ester with PEO side chains. *Solid State Ionics*, 156, 155-162.