

REFERENCES

- Agag, T. and Takeichi, T. (2007) High-molecular-weight AB-type benzoxazines as new precursors for high-performance thermosets. Journal of Polymer Science: Part A: Polymer Chemistry, 45, 1878-1888.
- Azaïs, P., Duclaux, L., Florian, P., Massiot, D., Lillo-Rodenas, MA., Linares-Solano, A., Peres, JP., Jehoulet, C., and Béguin, F. (2007) Causes of supercapacitors ageing in organic electrolyte. Journal of Power Sources, 171, 1046-1053.
- Baumann, T.F., Worsley, M.A., Yong-Jin Han, T., and Satcher, Jr. J.H. (2008) High surface area carbon aerogel monoliths with hierarchical porosity. Journal of Non-Crystalline Solids, 354, 3513-3515.
- Biesmans, G., Mertens, A., Duffours, L., Woignier, T., and Phalippou, J. (1998) Polyurethane based organic aerogels and their transformation into carbon aerogels. Journal of Non-Crystalline Solids, 225, 64-68.
- Brunovska, Z., Liu, J.P., and Ishida, H. (1999) 1,3,5-Triphenylhexahydro-1,3,5-triazine-active intermediate and precursor in the novel synthesis of benzoxazine monomers and oligomers. Macromolecule Chemical Physics, 200, 1745-1752.
- Burke, W.J. (1949) 3,4-dihydro-1,3,2H-benzoxazines. reaction of p-substituted phenols with N,N-dimethylolamines. Journal of the American Chemical Society, 71, 609–612.
- Burke, W.J., Bishop, J.L., Glennie, E.L.M., and Bauer, W.N. (1965) A new aminoalkylation reaction. Condensation of phenols with dihydro-1,3- aroxazines. Journal of Organic Chemistry, 30, 3423–3427.
- Conway, B.E. (1991) Transition from capacitors to battery behavior in electrochemical energy storage. Journal of the Electrochemical Society, 138(6), 1539-1548.
- Dunkers, J. and Ishida, H. (1995) Vibrational assignments of N,N-bis(3,5-dimethyl-2-hydroxybenzyl)methylamine in the fingerprint region. Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy, 51, 855-867.

- Fairén-Jiménez, D., Carrasco-Marín, F., and Moreno-Castilla, C. (2006) Porosity and surface area of monolithic carbon aerogels prepared using alkaline carbonates and organic acids as polymerization catalyst. *Carbon*, 44, 2301-2307.
- Fang, B. and Binder, L. (2006) A modified activated carbon aerogel for high-energy storage in electrical double layer capacitors. *Journal of Power Sources*, 163, 616-622.
- Fischer, U., Saliger, R., Bock, V., Petricevic, R., and Fricke, J. (1997) Carbon aerogels as electrode material in supercapacitors. *Journal of Porous Materials*, 4, 281-285.
- Frackowiak, E. (2007) Carbon materials for supercapacitor application. *Physical Chemistry Chemical Physics*, 9, 1774-1785.
- Frackowiak, E. and Béguin, F. (2001) Review Carbon materials for the electrochemical storage of energy in capacitors. *Carbon*, 39, 937-950.
- Fu, R., Zheng, B., Liu, J., Dresselhaus, M.S., Dresselhaus, G., Satcher, Jr. J.H., and Baumann, T.F. (2003) The fabrication and characteristic of carbon aerogels by gelation and supercritical drying in isopropanol. *Advanced Functional Materials*, 13, 558-562.
- Ghosh, N.N., Kiskan, B., and Yagci, Y. (2007) Polybenzoxazines — New high performance thermosetting resins: Synthesis and properties. *Progress in Polymer Science*, 32, 1344-1391.
- He, X., Lei, J., Geng, Y., Zhang, X., Wu, M., and Zheng, M. (2009) Preparation of microporous activated carbon and its electrochemical performance for electric double layer capacitor. *Journal of Physics and Chemistry of Solids*, 70, 738-744.
- Holly, F.W. and Cope, A.C. (1944) Condensation products of aldehydes and ketones with o-aminobenzyl alcohol and o-hydroxybenzylamine. *Journal of The American Chemical Society*, 66, 1875–1879.
- Hwang, S.W. and Hyun, S.H. (2007) Synthesis and characterization of tin oxide/carbon aerogel composite electrodes for electrochemical supercapacitors. *Journal of Power Sources*, 172, 451-459.

- Ingram, M.D., Pappin, A.J., Delalande, F., Poupart, D., and Terzulli, G. (1998) Development of electrochemical capacitors incorporating processable polymer gel electrolytes. *Electrochimica Acta*, 43, 1601-1605.
- Ishida, H. US Patent 5,543,516, Assigned to Edison Polymer Innovation Corporation.
- Ishida, H. and Allen, D. (1996) Physical and mechanical characterization of near-zero shrinkage polybenzoxazines. *Journal of Polymer Science: Part B: Polymer Physics*, 34, 1019-1030.
- Ishikawa, M., Sakamoto, A., Morita, M., Matsuda, Y., and Ishida, K. (1996) Effect of treatment of activated carbon fiber cloth electrodes with cold plasma upon performance of electric double-layer capacitors. *Journal of Power Sources*, 60, 233-238.
- Kalpana, D., Omkuma, K.S., Suresh Kumar, S., and Renganathan, N.G. (2006) A novel high power symmetric ZnO/carbon aerogel composite electrode for electrochemical supercapacitor. *Electrochimica Acta*, 52, 1309-1315.
- Katanyoota, P., Chaisuwan, T., Wongchaisuwat, A., and Wongkasemjit, S. (2010) Novel polybenzoxazine-based carbon aerogel electrode for supercapacitors. *Materials Science and Engineering B*, 167, 36-42.
- Lee, J.K. (2006) Polyurea aerogels, US Patent # 0211840 A1.
- Li, W. and Guo, S. (2000) Preparation of low-density carbon aerogels from a cresol /formaldehyde mixture. *Carbon*, 38, 1499-1524.
- Li, W., Pröbstle, H., and Fricke, J. (2003) Electrochemical behavior of mixed CmRF based carbon aerogels as electrode materials for supercapacitors. *Journal of Non-Crystalline Solids*, 325, 1-5.
- Li, W., Rechenauer, G., and Fricke, J. (2002) Carbon aerogels derived from cresol-resorcinol-formaldehyde for supercapacitors. *Carbon*, 40, 2955-2959.
- Li, J., Wang, X., Wang, Y., Huang, Q., Dai, D., Gamboa, S., and Sebastian, P.J. (2008) Structure and electrochemical properties of carbon aerogels synthesized at ambient temperatures as supercapacitors. *Journal of Non-Crystalline Solids*, 354, 19-24.

- Liu, J. Ph.D. (1995) Synthesis, characterization, reaction mechanism and kinetics of 3,4-dihydro-2H-1,3-benzoxazine and its polymers. Thesis, Case Western Reserve University, Cleveland OH.
- Meng, Q.H., Liu, L., Song, H.H., Zhang, R., and Ling, L.C. (2004) Electrochemical properties of carbon aerogels electrode for super-capacitor. Journal of Inorganic Materials, 19(3), 593-598.
- Momma, T., Liu, X., Osaka, T., Ushio, Y., and Sawada, Y. (1996) Electrochemical modification of active carbon fiber electrode and its application to double-layer capacitor. Journal of Power Sources, 60, 249-253.
- Ning, X. and Ishida, H. (1994) Phenolic materials via ring-opening polymerization-synthesis and characterization of bisphenol-a based benzoxazines and their polymers. Journal of Polymer Science: Part A: Polymer Chemistry, 32, 1121-1129.
- Prabaharan, S.R.S., Vimala, R., and Zainal, Z. (2006) Nanostructured mesoporous carbon as electrodes for supercapacitors. Journal of Power Sources, 161, 730-736.
- Pekala, R.W., Alviso, C.T., Kong, F.M., and Hulsey, S.S. (1992) Aerogels derived from multifunctional organic monomers. Journal of Non-Crystalline Solids, 145, 90-98.
- Saliger, R., Fischer, U., Herta, C., and Fricke, J. (1998) High surface area carbon aerogel for supercapacitors. Journal of Non-Crystalline Solids, 225, 81-85.
- Sepehri, S., García, B.B., Zhang, Q., and Cao, G. (2009) Enhanced electrochemical and structural properties of carbon cryogels by surface chemistry alteration with boron and nitrogen. Carbon, 47, 1436-1443.
- Takeichi, T., Kano, T., and Agag, T. (2005) Synthesis and thermal cure of high molecular weight polybenzoxazine precursors and the properties of the thermosets. Polymer, 46, 12172-12180.
- Tamon, H., Ishizaka, H., Araki, T., and Okazaki, M. (1998) Control of mesoporous structure of organic and carbon aerogels, Carbon, 36, 1257-1262.
- Tamon, H., Ishizaka, H., Mikami, M., and Okazaki, M. (1997) Porous structure of

- organic and carbon aerogels synthesized by sol-gel polycondensation of resorcinol with formaldehyde. Carbon, 35, 791-796.
- Wu, D. and Fu, R. (2005) Fabrication and physical properties of organic and carbon aerogel derived from phenol and furfural. Journal of Porous Materials, 12, 311-316.
- Wang, J., Yang, X., Wu, D., Fu, R., Dresselhaus, M.S., and Dreaelhaus, G. (2008) The porous structures of activated carbon aerogels and their effects on electrochemical performance. Journal of Power Sources, 185, 589-594.
- Wang, J., Zhang, S.Q., Guo, Y.Z., Shen, J., Attia, S.M., Zhou, B., Zheng, G.Z., and Gui, Y.S. (2001) Morphological effects on the electrical and electrochemical properties of carbon aerogels. Journal of The Electrochemical Society, 148, D75-D77.
- Zhang, R., Lu, Y., Zhan, L., Liang, X., Wu, G., and Ling, L. (2002) Monolithic carbon aerogels from sol-gel polymerization of phenolic resoles and methyloated melamine. Carbon, 41, 1645-1687.

CURRICULUM VITAE

Name: Ms. Nuntiya Mahingsupan

Date of Birth: June 22nd, 1985

Nationality: Thai

University Education:

2003-2007 Bachelor Degree of Science in Industrial Chemistry, Faculty of Applied Science, King Mongkut's University of Technology North Bangkok, Bangkok, Thailand

Work Experience

2007-2008	Position: Research assistant
	Company name: Institute of Solar Energy Technology Development (SOLARTEC), National Science and Technology Development Agency (NSTDA), Pathumthani, Thailand

Honors and Scholarships:

1. Second class honor in B.Sc. (Industrial Chemistry), King Mongkut's University of Technology North Bangkok.

Proceedings:

1. Mahingsupan, N.; Wongkasemjit, S.; and Chaisuwan, T. (2010, March 21-25) Novel Electrode for Supercapacitors from Carbon Aerogel Composites. Proceedings of the 239th ACS National Meeting & Exposition, San Francisco, CA, USA.
2. Mahingsupan, N.; Aussawasathien, D.; Wongkasemjit, S.; and Chaisuwan, T. (2010, April 22) Novel Electrode for Supercapacitors from Polybenzoxazine-Derived Carbon Aerogel. Proceedings of the 1st National Symposium on Petroleum, Petrochemicals, and Advances Materials and the 16th PPC Symposium on Petroleum, Petrochemicals, and Polymers, Bangkok, Thailand.



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