

## บรรณานุกรม

- เจริญ นาคะสรรค์. 2546. *เทคโนโลยีเบื้องต้นทางพลาสติก*. กรุงเทพฯ: โฟร์เพช.
- ชัยวัฒน์ เจนวาณิชย์. 2526. *โพลีเมอร์เชิงพาณิชย์*. กรุงเทพฯ: โอเดียนสโตร์.
- พรพรรณ นิธิอุทัย. 2528. *สารเคมีสำหรับยาง*. ภาควิชาเทคโนโลยียางและพอลิเมอร์ คณะวิทยาศาสตร์และเทคโนโลยี มหาวิทยาลัยสงขลานครินทร์ วิทยาเขตปัตตานี.
- วารกรณ์ ขจรไชยกุล. 2552. *ผลิตภัณฑ์ยาง : กระบวนการผลิตและเทคโนโลยี (Rubber Products: Manufactories & Technology)*. สำนักงานกองทุนสนับสนุนการวิจัย (สกว). กรุงเทพฯ: ซีใน พับลิชชิง.
- ศุภวัฒน์ ชุมคล้าย. 2552. *อิทธิพลของระบบวัลคาไนซ์แบบผสมและสารป้องกันการเสื่อมสภาพต่อสมบัติของเทอร์โมพลาสติกวัลคาไนซ์จากการเบลนด้วยธรรมชาติกับพอลิโพรไพลีน*. วิทยานิพนธ์วิทยาศาสตรบัณฑิต, สาขาวิชาเทคโนโลยียางและพอลิเมอร์ คณะวิทยาศาสตร์และเทคโนโลยี, มหาวิทยาลัยสงขลานครินทร์.
- Akzo Nobel Chemicals, A. *Crosslinking Peroxides*, Akzo Nobel Chemicals. BV, The Netherlands, 2002.
- Annual Book of ASTM D412-98a. 2002. *Standard Test Method for Vulcanized Rubber and Thermoplastic Elastomers-Tension*. Section 9: Rubber, 09.01. 44-57.
- Annual Book of ASTM D471-98. 1998. *Standard Test Method for Rubber Property-Effect of Liquids*. Section 9: Rubber, 09.01.
- Annual Book of ASTM D2240-03. 2003. *Standard Test Method for Rubber Property-Durometer Hardness*. Section 9: Rubber, 09.01.
- Annual Book of ASTM D6601-00. 2000. *Standard Test Method for Rubber Properties-Measurement of Cure and After-Cure Dynamic Properties Using a Rotorless Shear Rheometer*. Section 9: Rubber, 09.01.
- Asaletha, R., Kumaran, M.G. and Thomas, S. 1999. Thermoplastic Elastomer from Blends of Polystyrene and Natural Rubber: Morphology and Mechanical Properties. *Eur. Polym. J.* 35, 253-271.
- Azizi, H. and Ghasemi, G. 2004. Reactive Extrusion of Polypropylene: Production of Controlled-Rheology Polypropylene (CRPP) by Peroxide-Promoted Degradation. *Polym. Test.* 23, 137-143.

- Azizi, H., Ghasemi, G. and Karrabi, M. 2008. Controlled-Peroxide Degradation of Polypropylene: Rheological Properties and Prediction of MWD from Rheological Data. *Polym. Test.* 27, 548-554.
- Babu, R.R., Singha, N.K. and Naskar, K. 2008. Studies on the Influence of Structurally Different Peroxides in Polypropylene/Ethylene Alpha Olefin Thermoplastic Vulcanizates (TPVs). *Express Polym. Lett.* 2, 226-236.
- Babu, R.R., Singha, N.K. and Naskar, K. 2009. Dynamically Vulcanized Blends of Polypropylene and Ethylene-Octene Copolymer: Comparison of Different Peroxides on Mechanical, Thermal, and Morphological Characteristics. *J. Appl. Polym. Sci.* 113, 1836-1852.
- Babu, R.R., Singha, N.K. and Naskar, K. 2010a. Dynamically Vulcanized Blends of Polypropylene and Ethylene Octene Copolymer: Influence of Various Coagents on Thermal and Rheological Characteristics. *J. Appl. Polym. Sci.* 117, 1578-1590.
- Babu, R.R., Singha, N.K. and Naskar, K. 2010b. Interrelationships of Morphology, Thermal and Mechanical Properties in Uncrosslinked and Dynamically Crosslinked PP/EOC and PP/EPDM Blends. *Express Polym. Lett.* 4, 197-209.
- Babu, R.R., Singha, N.K. and Naskar, K. 2010c. Melt Viscoelastic Properties of Peroxide Cured Polypropylene-Ethylene Octene Copolymer Thermoplastic Vulcanizates. *Polym. Eng. Sci.* 50, 455-467.
- Barton, A.F.N. 1991. *CRC Handbook of Polymer-Liquid Interactive Parameters and Solubility Parameters*. Florida: CRC Press Inc.
- Blanksby, S.J. and Ellison, G.B. 2003. Bond Dissociation Energies of Organic Molecules. *Acc. Chem. Res.* 36, 255-263.
- Bomo, F. 1996. *Meeting of Rubber Division*. Montreal: ACS, May 5-8, Paper E.
- Bonner, J.G. and Hope, P.S. 1993. Compatibilisation and Reactive Blending in *Polymer Blends and Alloys*, Folkes, M.J. and Hopr, P.S., editors. London: Blackie Academic & Professional.
- Brydson, J.A. 1988. *Rubbery Materials and Their Compounds*. London: Elsevier Science Publishers.
- Carone, E.Jr., Kopcak, U., Goncalves, M.C. and Nunes, S.P. 2000. In Situ Compatibilization of Polyamide 6 / Natural Rubber Blends with Maleic Anhydride. *Polymer.* 41, 5929-5935.

- Chatterjee, K. and Naskar, K. 2007. Development of Thermoplastic Elastomers Based on Maleated Ethylene Propylene Rubber (m-EPM) and Polypropylene (PP) by Dynamic Vulcanization. *Express Polym. Lett.* 1, 527–534.
- Chen, H.B., Kocsis, J.K., Wu, J.S. and Varga, J. 2002. Fracture Toughness of  $\alpha$ - and  $\beta$ -Phase Polypropylene Homopolymers and Random- and Block-Copolymers. *Polymer.* 43, 6505-6514.
- Choi, S.S., Kim, J.C., Lee, S.G. and Joo, Y.L. 2008. Influence of the Cure Systems on Long Time Thermal Aging Behaviors of NR Composites. *Macromol. Res.* 16, 561-556.
- Coran, A.Y. 2005. Vulcanization *in Science and Technology of Rubber*, Mark, J.E., Erman, B. and Eirich, F.R., editors. Burlington: Elsevier Academic Press.
- Couplink 89 Data Sheet: Zhenjiang Wholemark Fine Chemical Co., Ltd, 2006.
- Datta, S. and Lohse, D.J. 1996. *Polymeric Compatibilizers Uses and Benefits in Polymer Blends: General Aspects of Compatibilizer*. Munich: Hanser Publishers.
- Degussa. 1997. *Basic Characteristics of Aerosil*. Frankfurt/Main.
- Dierkes, W. 2005. *Economic Mixing of Silica-Rubber Compounds Interaction between the Chemistry of the Silica-Silane reaction and the Physics of Mixing*. Ph.D Thesis, University of Twente.
- Dick J.S. 2001. *Rubber Technology: Compounding and Testing for Performance*. Munich: Hanser Gardner Pubns.
- Dluzneski, P.R. 2001. Peroxide Vulcanization of Elastomer. *Rubb. Chem. Tech.* 74, 451-492.
- Donnet, J.B. and Custodero, M. 2005. Reinforcement of Elastomers by Particulate Fillers *in Science and Technology of Rubber*, Mark, J.E., Erman, B. and Eirich, F.R., editors. Burlington: Elsevier Academic Press.
- Dybal, J. and Krimm, S. Normal-Mode Analysis of Infrared and Raman of Crystalline Poly(Methyl Methacrylate). *Macromolecules.* 23, 1301–1308.
- Fan, L.R., Zhang, Y., Li, F., Zhang, Y.X., Sun, Kang. and Fan, Y.Z. 2001. Effect of High Temperature Curing on the Crosslink Structures and Dynamic Mechanical Properties of Gum and N330-Filled Natural Rubber Vulcanizates. *Polym. Test.* 20, 925-936.
- Flory P.J. and Rehner J. 1943. Statistical Mechanics of Cross-Linked Polymer Networks. *J. Chem. Phys.* 11, 521-526.

- Gang, X., Yang, W., Shan, G.F., Yang, B., Xie, B.H., Yang, M.B. and Hou, Meng. 2009. Effect of Temperature Gradient on the Development of  $\beta$  Phase Polypropylene in Dynamically Vulcanized PP/EPDM Blends. *Colloid Polym. Sci.* 287, 1237–1242.
- George, S., Joseph, R., Thomas, S. and Varughese, K.T. 1995. Blends of Isotactic Polypropylene and Nitrile Rubber: Morphology, Mechanical Properties and Compatibilization. *Polymer*. 36, 4405-4416.
- George, S., Ramamurthy, K., Anand, J.S., Groeninckx, G., Varughese, K.T. and Thomas, S. 1999a. Rheological Behaviour of Thermoplastic Elastomer from Polypropylene/Acrylonitrile-Butadiene Rubber Blends : Effect of Blend Ratio, Reactive Compatibilization and Dynamic Vulcanization. *Polymer*. 40, 4325-4334.
- George, S.C., Knorren, M. and Thomas, S. 1999b. Effect of Nature and Extent of Crosslinking on Swelling and Mechanical Behavior of Styrene-Butadiene Rubber Membranes. *J. Membrane Sci.* 163, 1-17.
- George, S., Varughese, K.T. and Thomas, S. 2000. Thermal and Crystallization Behavior of Isotactic Polypropylene/Nitrile Rubber Blends. *Polymer*. 41, 5485-5503.
- Gilg, B., Knoloch, G., Muller, D., Kramer, E., Pauquet, J.R., Rota-Graziosi, P., Schmitter, J., Schwarzenbach, K. and Zingg, J. 2000. Antioxidants in *Plastics Additives Handbook*. 5th Ed. Zweifel, H., editor. Munich : Hanser Publishers.
- Heideman, G., Datta, R. N., Noordermeer, J. W. M. and Baarle, B.V. 2004 .Influence of Zinc Oxide during Different Stages of Sulfur Vulcanization. Elucidated by Model Compound Studies. *J. Appl. Polym. Sci.* 95, 1388–1404.
- Henning, S.K. 2004. The Use of Coagents in the Radical Cure of Elastomers. *Proceedings of the 56th IWCS*. 587-593.
- Holden, G. 2000. *Understanding Thermoplastic Elastomers*. Munich: Hanser Publishers.
- Hou, W.M., Liu, G., Zhou, J.J., Li, Y., Li L., Zheng, S., Xin, Z. and Zhao, L.Q. 2006. The Influence of Crystal Structures of Nucleating Agents on the Crystallization Behaviors of Isotactic Polypropylene. *Colloid Polym. Sci.* 285, 11-17.
- Huang, H., Yang, J., Liu, X. and Zhang, Y. 2002. Dynamically Vulcanized Ethylene Propylene Diene Terpolymer/Nylon Thermoplastic Elastomer. *Eur. Polym. J.* 38, 857-861.

- Indian rubber institute. 1999. Rubber Engineering. New Delhi: Tata McGraw-Hill Publishing Company limited.
- Ishiaku, U.S., Ismail, H. and Ishak, Z.A.M. 1999. The Effect of Mixing Time on the Rheological, Mechanical and Morphological Properties of Poly(Vinyl Chloride)-Epoxidized Natural Rubber Blends. *J. Appl. Polym. Sci.* 73, 75-83.
- Jain, S., Goossens, H., Duin, M.V. and Lemstra, P. 2005. Effect of In Situ Prepared Silica Nano-Particles on Non-Isothermal Crystallization of Polypropylene. *Polymer*. 46, 8805–8818.
- John, B., Varughese, K.T., Oommen, Z., Poschke, P. and Thomas, S. 2003. Dynamic Mechanical Behavior of High-Density Polyethylene/Ethylene Vinyl Acetate Copolymer Blends: Effect of the Blends Ratio, Reactive Compatibilization and Dynamic Vulcanization. *J. Appl. Polym. Sci.* 87, 2083-2099.
- Kenji, Y. and Masao, H. 1976. Dynamic Mechanical and X-Ray Studies of Annealed Isotactic Polypropylene. *Jpn. J. Appl. Phys.* 15, 225.
- Liu, X., Huang, H., Xie, Z.Y., Zhang, Y., Zhang, Y.X., Sun, K. and Min, L. 2003. EPDM/polyamide TPV Compatibilized by Chlorinated Polyethylene. *Polym. Test.* 22, 9-16.
- Moly, K.A., Oommen, Z., Bhagawan, S.S., Groeninckx, G. and Thomas, S. 2002. Melt Rheology and Morphology of LLDPE/EVA Blends: Effect of Blend Ratio, Compatibilization, and Dynamic Crosslinking. *J. Appl. Polym. Sci.* 86, 3210-3225.
- Montoya, M., Tomba, J.P., Carella, J. M., Gobernado, M. and Isabel, M. 2004. Physical Characterization of Commercial Polyolefinic Thermoplastic Elastomers. *Eur. Polym. J.* 40, 2757-2766.
- Morria, G. 1979. *Developments in Rubber Technology*. London: Elsevier Applied Science Publisher.
- Nakason, C., Panklieng, A. and Kaesaman, A. 2004. Rheological and Thermal Properties of Thermoplastic Natural Rubbers Based on Poly(Methyl Methacrylate)/Epoxidized Natural Rubber Blends. *J. Appl. Polym. Sci.* 92, 3561-3572.
- Nakason, C., Nuansomsri, K., Kaesaman, A. and Kiatkamjornwong, S. 2006a. Dynamic Vulcanization of Natural Rubber/High-Density Polyethylene Blends: Effect of Compatibilization, Blend Ratio and Curing System. *Polym. Test.* 25, 782-796.

- Nakason, C., Saiwari, S. and Kaesaman, A. 2006b. Rheological Properties of Maleated Natural Rubber/Polypropylene Blends with Phenolic Modified Polypropylene and Polypropylene-g-Maleic Anhydride Compatibilizers. *Polym. Test.* 25, 413-423.
- Nakason, C., Saiwari, S., Tatun, S. and Kaesaman, A. 2006c. Rheological Thermal and Morphological Properties of Maleated Natural Rubber and its Reactive Blending with Poly(Methyl Methacrylate). *Polym. Test.* 25, 656-667.
- Nakason, C., Wannavilai, P. and Kaesaman, A. 2006d. Effect of Vulcanization System on Properties of Thermoplastic Vulcanizates Based on Epoxidized Natural Rubber/Polypropylene Blends. *Polym. Test.* 25, 34-41.
- Nakason, C., Worlee, A. and Salaeh, S. 2008. Effect of Vulcanization System on Properties and Recyclability of Dynamically Cured Epoxidized Natural Rubber/Polypropylene Blends. *Polym. Test.* 27, 858-869.
- Nakason, C. and Kaewsakul, W. 2009. Influence of Oil Contents in Dynamically Cured Natural Rubber and Polypropylene Blends. *J. Appl. Polym. Sci.* 115, 540-548.
- Naphthenic Oil Data Sheet : Panjin Nynas North Bitumen Co., Ltd, 2005.
- Narathichat, M., Sahakaro, K. and Nakason, C. 2009. Assessment Degradation of Natural Rubber by Moving Die Processability Test and FTIR Spectroscopy. *J. Appl. Polym. Sci.* 115, 1702-1709.
- Naskar, K. and Noordermeer, J.W.M. 2002. Dynamically Vulcanized PP/EPDM Blends : Effects of Different Types of Peroxides on the Properties. Presented at a Meeting of the Rubber Division. American Chemical Society. Pittsburgh, PA., Oct 8-11, 2002.
- Naskar, K., Kokot, D. and Noordermeer, J.W.M. 2004. Influence of Various Stabilizers on Ageing of Dicumyl Peroxide-Cured Polypropylene/Ethylene-Propylene-Diene Thermoplastic Vulcanizates. *Polym. Degrad. Stab.* 85, 831-839.
- Nitta, K.H., Asuka, K., Liu, B. and Terano, M. 2006. The Effect of the Addition of Silica Particals on Linear Spherulite Growth Rate of Isotactic Polypropylene and its Explanation by Lamellar Cluster Model. *Polymer.* 47, 6457-6463.
- Odian, G. (2004). *Principles of Polymerization*. New Jersey: A John Wiley & Sons, Inc., publication.

- Oommen, Z. and Thomas, S. 1997. Mechanical Properties and Failure of Thermoplastic Elastomer from Natural Rubber/Poly(methyl Methacrylate)/Natural Rubber-g-Poly(Methyl Methacrylate) Blends. *J. Appl. Polym. Sci.* 65, 1245-1255.
- Pimonsiriphol, V., Seaoui, P. and Sirisinha, C. 2007. Relationship Among Thermal Ageing Degradation, Dynamic Properties, Cure Systems, and Antioxidants in Natural Rubber Vulcanisates. *Polym. Plast. Technol. Eng.* 46, 113-121.
- Poh, B.T. and Tang, W.L. 1995. Concentration Effect of Stearic Acid on Scorch Behavior of Epoxidized Natural Rubber. *J. Appl. Polym. Sci.* 55, 537-542.
- Poh, B.T. and Kasmuri, M.B. 1999a. Effect of Stearic Acid Concentration on the Reversion Behavior of Epoxidized Natural Rubber. *J. Appl. Polym. Sci.* 73, 1165-1169.
- Poh, B.T. and Te, C.S. 1999b. Dependence of Mooney Scorch Time of SMR L, ENR 25, and ENR 50 on Concentration and Types of Antioxidants. *J. Appl. Polym. Sci.* 74, 2940-2946.
- Poh, B.T. and Te, C.S. 2000. Cure Index and Activation Energy of Vulcanization of Natural Rubber and Epoxidized Natural Rubber Vulcanized in the Presence of Antioxidants. *J. Appl. Polym. Sci.* 77, 3234-3238.
- Poussin, L., Bertin, Y.A., Parisot, J. and Brassy, C. 1998. Influence of Thermal Treatment on the Structure of an Isotactic Polypropylene. *Polymer.* 39, 4261-4265.
- Sahakaro, K., Pongpaiboon, C. and Nakason, C. 2008. Improved Mechanical Properties of NR/EPDM Blends by Controlling the Migration of Curative and Filler via Reactive Processing Technique. *J. Appl. Polym. Sci.* 111, 2035-2043.
- Saville B. and Watson A.A. 1967. Structural Characterization of Sulfur-Vulcanized Rubber Networks. *Rubber Chem. Technol.* 40, 100-148.
- Sirisinha, C., Phoowakeereewiwat, S. and Sae-oui, P. 2004. Cure and Dynamic Mechanical Properties in Peroxide-Cured Isoprene Rubber : Effects of Stearic Acid and Amine-Based Antioxidant. *Eur. Polym. J.* 40, 1779-1785.
- B.G. Soares,<sup>1</sup> M.S.M. Almeida, C. Ranganathaihc, M.V. Deepa Ursc, Siddaramaiahb

- Soares, B.G., Almeida, M.S.M., Ranganathaiah, C. and Siddaramaiah M.V. Deepa Urs. 2007. The Characterization of PP/NBR Blends by Positron Annihilation Lifetime Spectroscopy (PALS): The Effect of Composition and Dynamic Vulcanization. *Polym. Test.* 26, 88-94.
- Soliman M., Dijk M.V., Es M.V. and Shulmeister V. 1999. Deformation Mechanism of Thermoplastic Vulcanisates Investigated by Combined FTIR and Stress-Strain Measurements. in *Proceedings of ANTEC '99*. NewYork. 2, 1947-1954.
- Supri and Ismail, H. 2006. Effects of Dynamic Vulcanization and Glycidyl Methacrylate on Properties of Recycled Poly(Vinyl Chloride)/Acrylonitrile Butadiene Rubber Blends. *Polym. Test.* 25, 318-326.
- Thitithammawong, A., Nakason, C., Sahakaro, K. and Noordermeer, J. 2007a. Effect of Different Types of Peroxides on Rheological, Mechanical, and Morphological Properties of Thermoplastic Vulcanizates Based on Natural Rubber/Polypropylene Blends. *Polym. Test.* 26, 537-546.
- Thitithammawong, A., Noordermeer, J., Kaesaman, A. and Nakason, C. 2007b. Influence of Compatibilizers on the Rheological, Mechanical, and Morphological Properties of Epoxidized Natural Rubber/Polypropylene Thermoplastic Vulcanizates. *J. Appl. Polym. Sci.* 107, 2436-2443.
- Varga, J., Mudra, I. and Ehrenstein, G.W. 1999. Highly Active Thermally Stable  $\beta$ -Nucleating Agents for Isotactic Polypropylene. *J. Appl. Polym. Sci.* 74, 2357-2368.
- Xavier, T. 2002. A General Review of Recent Developments on Chemical Modification of Natural Rubber. *Newsletter of the Rubber Foundation Information Center for Natural Rubber, Natural Rubber.* 28, 10-11.
- Yu, J.H., Duan, J.K., Peng, W.Y., Wang, L.C. and Jiang, P.K. 2011. Influence of Nano-AlN Particles on Thermal Conductivity, Thermal Stability and Cure Behavior of Cycloaliphatic Epoxy/Trimethacrylate System. *Express Polym. Lett.* 5, 132-141.
- Yuushi, M., Masao, H., Kenichi, Y., Yuki, K and Masaru, I. 2006. Effect of Annealing of Polypropylene on Ductility. *Japanese J. Polym. Sci. Technol.* 63, 98-102.
- Zhao, S., Cai, Z. and Xin, Z. 2008. A Highly Active Novel  $\beta$ -Nucleating Agent for Isotactic Polypropylene. *Polymer.* 49, 2745-2754.

<http://www.nicirubberchemicals.com/Aproducthandbook-bec>. (accessed May 11, 2011)

<http://www.matbase.com>. (accessed March 29, 2011)