REFFERENCES

Anderson, M.W. Egger, C.C. Tiddy, G.J.T. Casci, J.L. Brakke, K.A. (2005) A New Minimal Surface and the Structure of Mesoporous Silicas, Angewandte Chemie International Edition, 44, 3243-8.

Chao, M.C. Lin, H.P. Wang, D.S. Mou, C.Y. (2004) Synthesis of SBA-1 Mesoporous Silica Crystals with Tunable Pore Size Using Sodium Silicate and Alkyltrimethylammonium Surfactants; Chemistry Letters, 33, 374-5.

Chao, M.C. Lin, H.P. Wang, D.S. Tang, C.Y. (2005) Controlling the crystal morphology of mesoporous silica SBA-1, Microporous and Mesoporous Materials, 83, 269-76.

Chao, M.C. Wang, D.S. Lin, H.P. Mou, C.Y. (2003) Control of single crystal morphology of SBA-1 mesoporous silica, Journal of Materials Chemistry, 13, 2853-4.

Charoenpinijkarn, W. Suwankruhasn, M. Kesapabutr, B. Wongkasemjit, S. Jamieson, A.M. (2001) Sol-gel processing of silatranes, European Polymer Journal, 37, 1441-8.

Che, S. Kamiya, S. Terasaki, O. Tatsumi, T. (2001) The Formation of Cubic $Pm\bar{3}n$ Mesostructure by an Epitaxial Phase Transformation from Hexagonal *p6mm* Mesophase, Journal of American Chemical Society, 123, 12089-90.

Che, S. Lim, S. Kaneda, M. Yoshitake, H. Terasaki, O. Tatsumi, T. (2002) The Effect of the Counteranion on the Formation of Mesoporous Materials under the Acidic Synthesis Process, Journal of American Chemical Society, 124, 13962-3.

Che, S. Sakamoto, Y. Terasaki, O. Tatsumi, T. (2002) Synthesis and Morphology Control of SBA-1 Mesoporous Silica with Surfactant of Cetyltrimethylammonium Bromide, Chemistry Letters., 2, 214-5.

Che, S. Sakamoto, Y. Yoshitake, H. Terasaki, O. Tatsumi, T. (2005) The structure and morphology control of mesoporous silica under acidic conditions," Microporous and Mesoporous Materials, 85, 207-18.

Dai, L.X. Tabata, K. Suzuki, E. Tatsumi, T. (2001) Synthesis and Characterization of V-SBA-1 Cubic Mesoporous Molecular Sieves, Chemistry of Materials, 13, 208-12.

Diaz, I. Garcia, B. Alonso, B. Casado, C.M. Moran, M. Losada, J. Pariente, J.P. (2003) Ferrocenyl Dendrimers Incorporated into Mesoporous Silica: New Hybrid Redox-Active Material, Chemistry of Materials, 15, 1073-9.

Goldfarb, D. Bernardo, M. Strohmaier, K.G. Vaughan, D.E.W. Thomann, H. (1994) Characterization of Iron in Zeolites by X-band and Q-Band ESR, Pulsed ESR, and UV-Visible Spectroscopies, Journal of American Chemical Society, 116, 6344-53.

Guan, S. Inagaki, S. Ohsuna, T. Terasaki, O. (2000) Cubic Hybrid Organic-Inorganic Mesoporous Crystal with a Decaoctahedral Shape, Journal of American Chemical Society, 122, 5660-1.

Guan, S. Inagaki, S. Ohsuna, T. Terasaki,O. (2001) Hybrid ethane–siloxane mesoporous materials with cubic symmetry, Microporous and Mesoporous Materials, 44-45, 165-72.

Han, S. Hou, W. Xu, J. Huang, X. Zheng, L. (2006) Study of the $Pm\bar{3}n$ Space Group of Cubic Mesoporous Silica, Chem. Phys. Chem., 7, 394-9.

Holmberg, K. Jonsson, B. Kronberg, B. Lindan, B. (2002) Surfactants and Polymers in Aqueous Solution Wiley, England.

Hukkamaki, J. Pakkanen, T. (2003) Amorphous silica materials prepared by neutral templating route using amine-terminated templates, Microporous and Mesoporous Materials, 65, 189-96.

Hulea, V. Dumitriu, E. (2004) Styrene oxidation with H_2O_2 over Ti-containing molecular sieves with MFI, BEA and MCM-41 topologies, Applied Catalysis A: General., 277, 99-106.

Huo, Q. Margolese, D.I. Ciesla, D.I. Demuth, D.G. Feng, P. Gier, T.E. Sieger, P. Firouzi, A. Chemelka, B.F. Schu¨ th, F. Stucky, G.D. (1994) Organization of Organic Molecules with Inorganic Molecular Species into Nanocomposite Biphase Arrays, Chemistry of Materials, 6, 1176-91.

Huo, Q. Margolese, D.I. Ciesla, U. Demuth, D.G. Feng, P. Gier, T.E. Sieger, P. Firouzi, A. Chemelka, B.F. Stucky, G.D. (1996) Surfactant Control of Phases in the Synthesis of Mesoporous Silica-Based Materials, Chemistry of Materials, 8, 1147-60.

Ji, D. Ren, T. Yan, L. Suo, J. (2003) Synthesis of Ti-incorporated SBA-1 cubic mesoporous molecular sieves, Materials Letters, 57, 4474-7.

Ji, D. Zhao, R. Lv, G. Qian, G. Yan, L. Suo, J. (2005) Direct synthesis, characterization and catalytic performance of novel Ti-SBA-1 cubic mesoporous molecularsieves, Applied Catalyst A: General., 281, 39-45.

Jitchum, V. Sun, C. Wongkasemjit, S. Ishida,H. (2001) Synthesis of spirosilicates directly from silica and ethylene glycol/ethylene glycol derivatives, Tetrahedron, 57 3997-4003.

Kao, H.M. Cheng, C.C. (2006) Tetramethoxysilane as a convenient silicon source for phase control of cubic SBA-1 mesostructures, Materials Letters, 60, 3059-62.

Kao, H.M. Cheng, C.C. Ting C.C. Hwang, L.Y. (2005) Phase control of cubic SBA-1 mesostructures via alcohol-assisted synthesis, Journal of Materials Chemistry, 15, 2989-92.

Kao, H.M. Wu, J.D. Cheng C.C. Chiang, A.S.T. (2006) Direct synthesis of vinyl-functionalized cubic mesoporous silica SBA-1, Microporous and Mesoporous Materials, 88, 319-28.

Kim, M.J. Ryoo, R. (1999) Synthesis and Pore Size Control of Cubic Mesoporous Silica SBA-1, Chemistry of Materials, 11, 487-91.

Laha, S.C. Kumar, R. (2001) Selective Epoxidation of Styrene to Styrene Oxide over TS-1 Using Urea-Hydrogen Peroxide as Oxidizing Agent, Journal of Catalysis, 204, 64-70.

Larsen, G. Lotero, E. (2000) Amine Dendrimers as Templates for Amorphous Silicas, Journal of Physical Chemistry B, 104, 4840-3.

Larsen, G. Lotero, E. Marquez, M. (2000) Use of Polypropyleneimine Tetrahexacontaamine (DAB-Am-64) Dendrimer as a single-Molecule

Template to Produce Mesoporous Silicas, Chemistry of Materials, 12, 1513-5.

Li, Y. Feng, Z. Lian, Y. Sun, K. Zhang, L. Jia, G. Yang, Q. Li, C. (2005) Direct synthesis of highly ordered Fe-SBA-15 mesoporous materials under weak acidic conditions, Microporous and Mesoporous Materials, 84, 41-9.

Lin, H.P. Kao, C.P. Mou, C.Y. Liu, S.B. (2000) Counterion Effect in Acid Synthesis of Mesoporous Silica Materials, Journal of Physical Chemistry B, 104, 7885-94.

Lin, H.P. Mou, C.Y. (2002) Structural and Morphological Control of Cationic Surfactant-Templated Mesoporous Silica, Accounts of Chemical Research, 35, 927-35.

Liu, M.C. Sheu, H.S. Cheng,S. (2002) Drying induced phase transformation of mesoporous silica, Chemical. Communications, 23, 2854-5.

Mitra, A. Bhaumik, A. Imae, T. (2004) Synthesis and Characterization of Nanoporous Silica Using Dendrimer Molecules, Journal of Nanoscience Nanotechology, 14, 1052-5.

Morey, M.S. Davidson, A. Stucky, G.D. (1998) Silica-Based, Cubic Mesostructures: Synthesis, Characterization and Relevance for Catalysis, Journal of. Porous Materials, 5, 195-204.

N. Thanabodeekij, S. Sadthayanon, E. Gulari, S. Wongkasemjit, (2006) Extremely high surface area of ordered mesoporous MCM-41 by atrane route, Materials Chemistry and Physics, 98, 131- 7.

Ogura, M. Miyoshi, H. Naik, S.P. Okubo,T. (2004) Investigation on the Drying Induced Phase Transformation of Mesoporous Silica; A Comprehensive Understanding toward Mesophase Determination," Journal of American Chemical Society, 126, 10937-44.

Phiriyawirut, P. Jamieson, A. M. Wongkasemjit, S. (2005) VS-1 zeolite synthesized directly from silatrane, Microporous and Mesoporous Materials, 77, 203-13.

Phonthammachai, N. Chairassameewong, T. Gulari, E. Jameison, A.M. Wongkasemjit, S. (2003) Oxide One Pot Synthesis of a Novel Titanium Glycolate and Its Pyrolysis, J. Met. Mater. Min., 12, 23.

Sakamoto, Y. Diaz, I. Terasaki, O. Zhao, D. Perez-Pariente,J. Kim, J.M. Stucky, G.D. (2002) Three-Dimensional Cubic Mesoporous Structures of SBA-12 and Related Materials by Electron Crystallography, Journal of Physical Chemistry B, 106, 3118-23.

Sathupanya, M. Gulari, E. Wongkasemjit, S. (2002) ANA and GIS zeolite synthesis directly from alumatrane and silatrane by sol-gel process and microwave techniques, Journal of European Ceramic Society, 22, 2305-14.

Sathupanya, M. Gulari, E. Wongkasemjit, S. (2003) Na-A (LTA) zeolite synthesis directly from alumatrane and silatrane by sol-gel microwave techniques, Journal of European Ceramic Society, 23, 1293-303.

Sayari, A. (1996) Catalysis by Crystalline Mesoporous Molecular Sieves, Chemistry of Materials, 8, 1840-52.

Srinivasu, P. Lim, S.H. Kubota, Y. Tatsumi, T. (2006) Synthesis of highly ordered mesoporous $P6_3/mmc$ and p6mm phases by adding alcohols to the system for the SBA-1 synthesis, Catalysis Today, 111, 379-84.

Thanabodeekij, N. Tanglumlert, W. Gulari, E. Wongkasemjit, S. (2005) Synthesis of Ti-MCM-41 directly from silatrane and titanium glycolate and its catalytic activity, Applied Organometallic Chemistry, 19, 1047-54.

Thitsatarn, W. Gulari, E. Wongkasemjit, S. (2008) Synthesis of Fe-MCM-41 fromm silatrane and $FeCl_3$ via sol-gel process and its epoxidation activity, Applied Organometallic Chemistry, 22, 97-103.

Tuel, A. Gontier, S. (1996) Synthesis and Characterization of Trivalent Metal Containing Mesoporous Silicas Obtained by a Neutral Templating Route, Chemistry of Materials, 8, 114-22.

Vinu, A. Dedecek, J. Murugesan, V. Hartmann, M. (2002) Synthesis and Characterization of CoSBA-1 Cubic Mesoporous Molecular Sieves, Chemistry of Materials, 14, 2433-5.

Vinu, A. Krithiga, T. Balasubramanian, V.V. Asthana, A. Srinivasu, P. Mori, T. Agira, Ramanath, K.G. Ganesan, P.G. (2006) Characterization and Catalytic

Performances of Three-Dimensional Mesoporous FeSBA-1, Journal of Physical Chemistry B, 110, 11924-31.

Vinu, A. Krithiga, T. Murugesan, Hartmann, V.M. (2004) Direct Synthesis of Novel FeSBA-1 Cubic Mesoporous Catalyst and Its High Activity in the tert-Butylation of Phenol, Advance Materials, 16, 1817-21.

Vinu, A. Murugesan, V. Hartmann, M. (2003) Pore Size Engineering and Mechanical Stability of the Cubic Mesoporous Molecular Sieve SBA-1, Chemistry of Materials, 15, 1385-93.

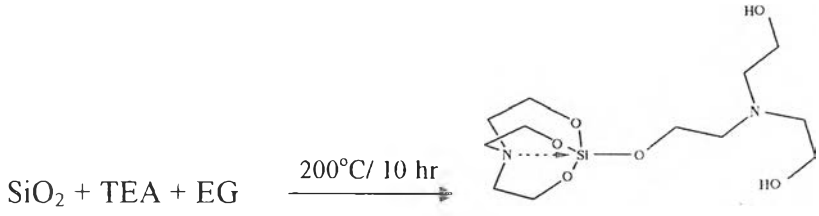
Wang; L. Kong, A. Chen, B. Ding, H. Shan, Y. He,M. (2005) Direct synthesis, characterization of Cu-SBA-15 and its high catalytic activity in hydroxylation of phenol by H_2O_2, Journal of Molecular Catalysis A: Chemical, 230, 143-50.

Wang, Y. Zhang, Q. Shishido, T. Takehira, K. (2002) Characterizations of Iron-Containing MCM-41 and Its Catalytic Properties in Epoxidation of Styrene with Hydrogen Peroxide, Journal of Catalysis, 209, 186-96.

Zheng, J. Zhai, S. Wu, D. Sun, Y. (2005) $S^+X^-I^+$ route to mesostructured materials from Fau and Beta zeolite precursors: A comparative study of their assembly behaviors in extremely acidic media, Journal of Solid State Chemistry, 178, 1630-6.

APPENDICES

Appendix A Silatrane Synthesis



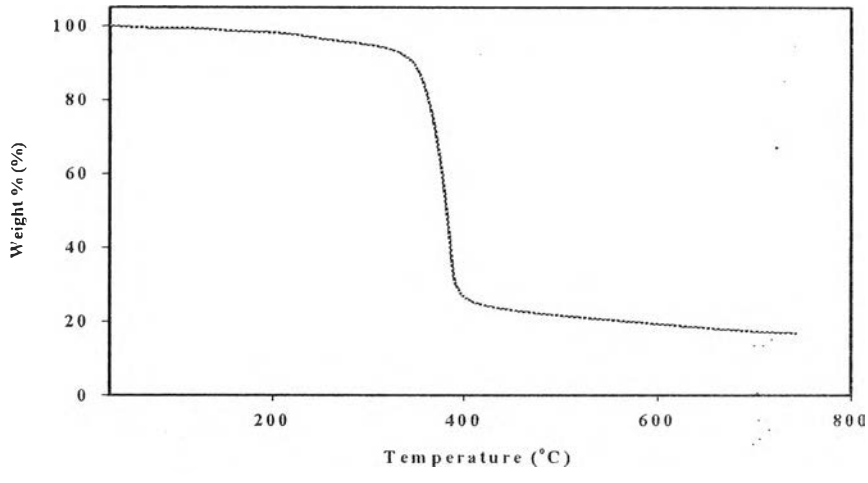


Figure A1 TGA of silatrane

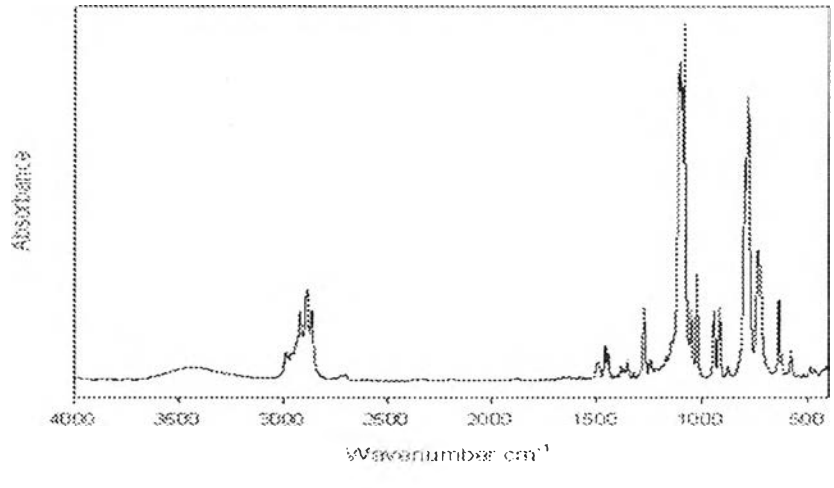


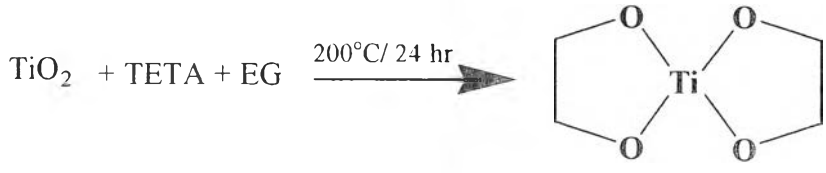
Figure A2 FTIR of silatrane

Table A1 FTIR spectrum of silatrane

Peak Positions (cm-1) Assignments		Peak Positions (cm-1)	Assignments
3100-3700	b, ν O-H	1276	m, ν C-O
2800-3000	s, ν C-H	1040-1180	b & vs, ν Si-O
2750-2670	w, Si<--N	786	vs, δ Si-O-C
1445, 1459, 1493	m, δ C-H	735	s, δ Si-O-C
1351	w, ν C-N	576	w, Si<--N

FAB^+-MS showed the highest m/e at 669 of $Si_3((OCH_2CH_2)_3N)_4H^+$ and 100% intensity at 323 of $Si((OCH_2CH_2)_3N)_2H^+$.

Appendix B Titanium Glycolate synthesis



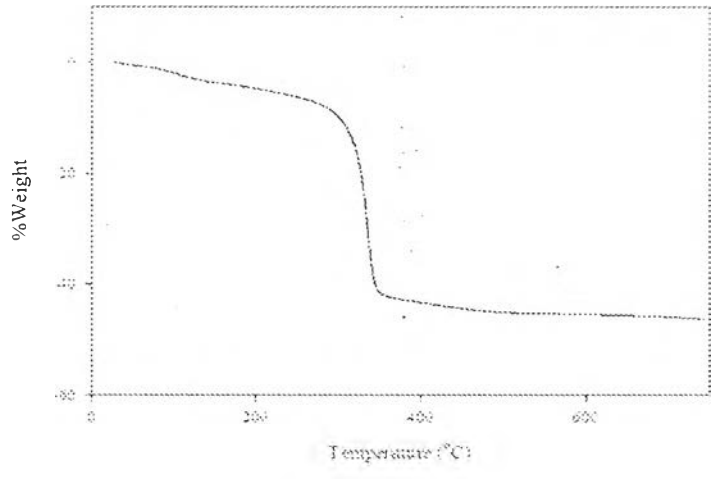


Figure B1 TGA of titanium glycolate

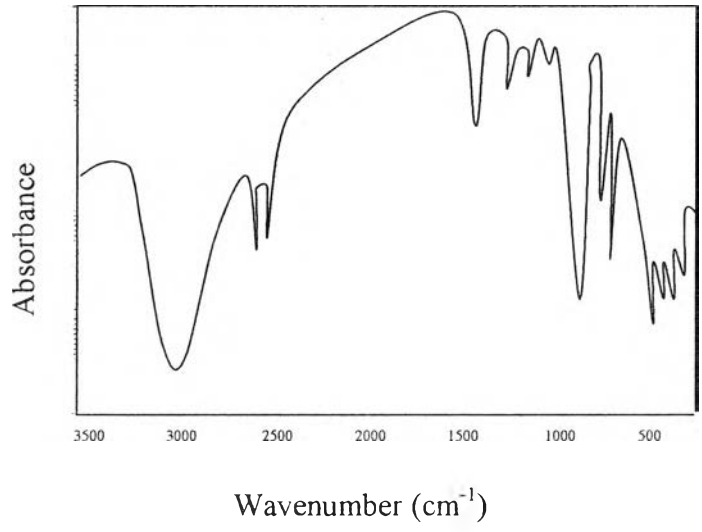


Figure B2 FTIR of silatrane

Table B1 FTIR spectrum of titanium glycolate

Peak Positions (cm-1) Assignments		Peak Positions (cm-1) Assignments	
3100-3700	b, ν O-H	1073	s, νC-O
2860-2986	s, νC-H	1049	s, νSi-O
1244-1275	m, νC-N	1021	s, νC-O
1170-1117	bs, νSi-O	785, 729	s, νSi-O-C
1093	s, νSi-O-C	579	w, Si<---N

FAB^{+}-MS: showed m/e 169 with 8.5% intensity of $Ti(OCH_2CH_2O)_2$.

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Publications:

1. Thanabodeekij, N., **Tanglumlert, W.**, Gulari, E. and Wongkasemjit, S. (2005) "Synthesis of Ti-MCM-41 directly from Silatrane and Titanium glycolate and Its Activity." Applied Organometallic Chemistry, 19(9), 1047-1054.
2. **Tanglumlert, W.**, Prasassarakich, P., Supaphol, P. and Wongkasemjit, S. (2006) "Hard-coating materials for poly(methyl methacrylate) from glycidoxypropyltrimethoxysilane-modified silatrane via sol-gel process." Surface & Coatings Technology, 200, 2784-2790.
3. **Tanglumlert, W.**, Imae, T., White, J.T., and Wongkasemjit, S. (2007) "Structural aspects of SBA-1 cubic mesoporous silica synthesized via a sol-gel process using silatrane precursor." Journal of American Ceramic Society, 90(12), 3992-7.
4. **Tanglumlert, W.**, Imae, and Wongkasemjit, S. (2008) "Fabrication of dendrimer porogen-capsulated mesoporous silica via sol-gel process of silatrane precursor." Journal of Nanoscience and Nanotechnology, 8, 1-7.

5. **Tanglumlert, W.**, Imae, T., White, J.T., and Wongkasemjit, S. (2008) "Preparation of highly ordered Fe-SBA-1 and Ti-SBA-1 cubic mesoporous silica via a sol-gel process of silatrane." Materials Letters, 62(30), 4545-8.
6. Wongkasemjit S., Tamuang, S., **Tanglumlert, W.**, Imae, T., (2009) "Synthesis of Mo-SBA-1 catalyst via sol-gel process and its activity" Materials Chemistry and Physics, 117(1), 301-6.

Presentations:

1. Tanglumlert, W., Prasassarakich, P., Supaphol, P. and Wongkasemjit, S. (2004) Scratch resistant Improvement of Poly(methyl methacrylate) via Sol-Gel Process. Presented at The International Conference on Smart/Intelligent Materials and Nanotechnology, Chiang Mai, Thailand. (Oral)
2. Tanglumlert, W., Imae, T., White, J.T., and Wongkasemjit, S. (2007) Synthesis of SBA-1 Mesoporous Silica via the Sol-Gel Process of Silatrane. Presented at RGJ-Ph.D. Congress VIII, Pattaya, Thailand. (Oral)
3. Tanglumlert, W., Imae, T., White, J.T., and Wongkasemjit, S. (2008) Preparation of highly ordered Fe-SBA-1 cubic mesoporous silica via sol-gel process of silatrane. Presented at the 2nd International Meeting on Developments in Materials, Processes and Applications of Nanotechnology (MPA-2008), Cambridge University, United Kingdom. (Poster)