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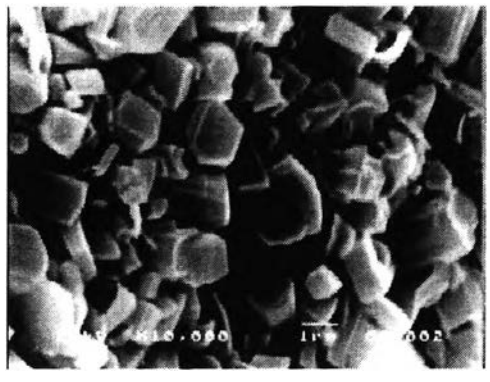
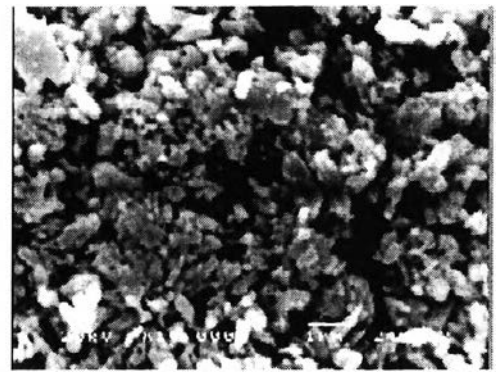
APPENDICES

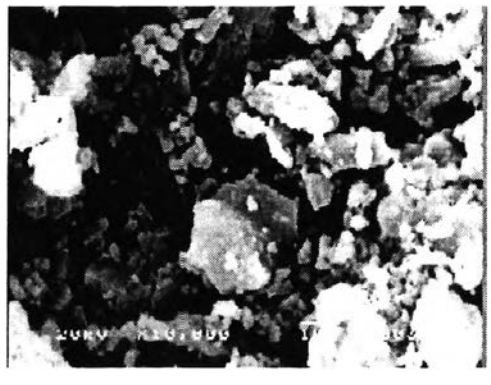
Appendix A The SEM micrographs of pyrolysed titanium glycolate at different temperatures with magnification of 10000.



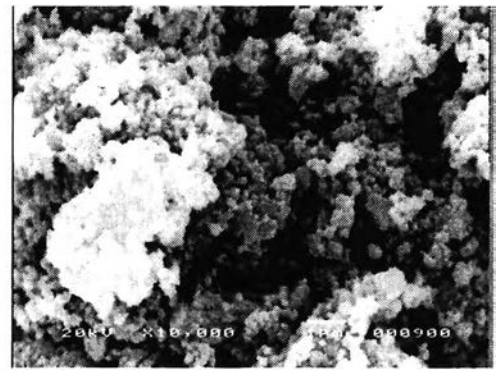
(a) Uncalcined



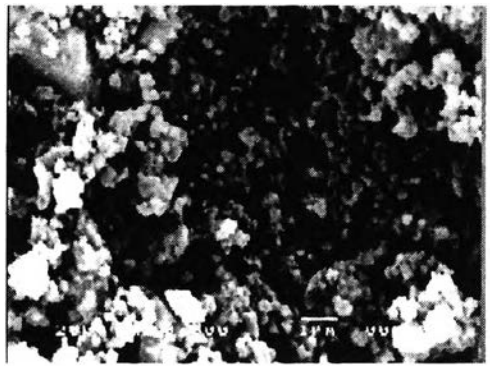
(d) Calcined at 700 °C



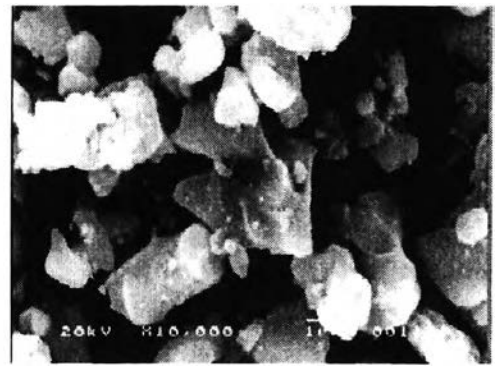
(b) Calcined at 300 °C



(e) Calcined at 900 °C

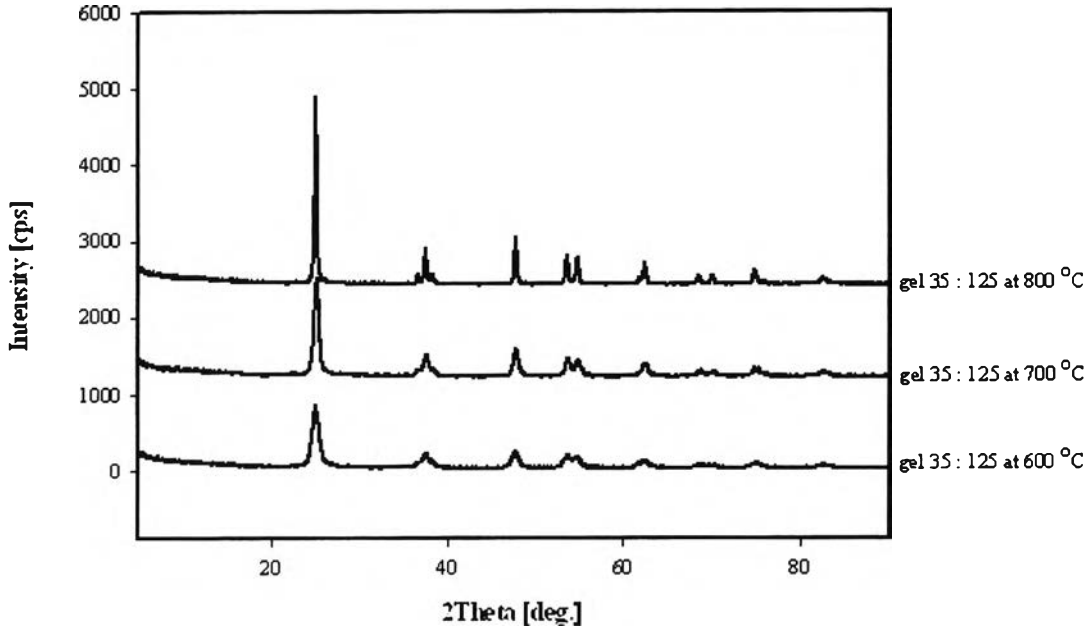


(c) Calcined at 500 °C

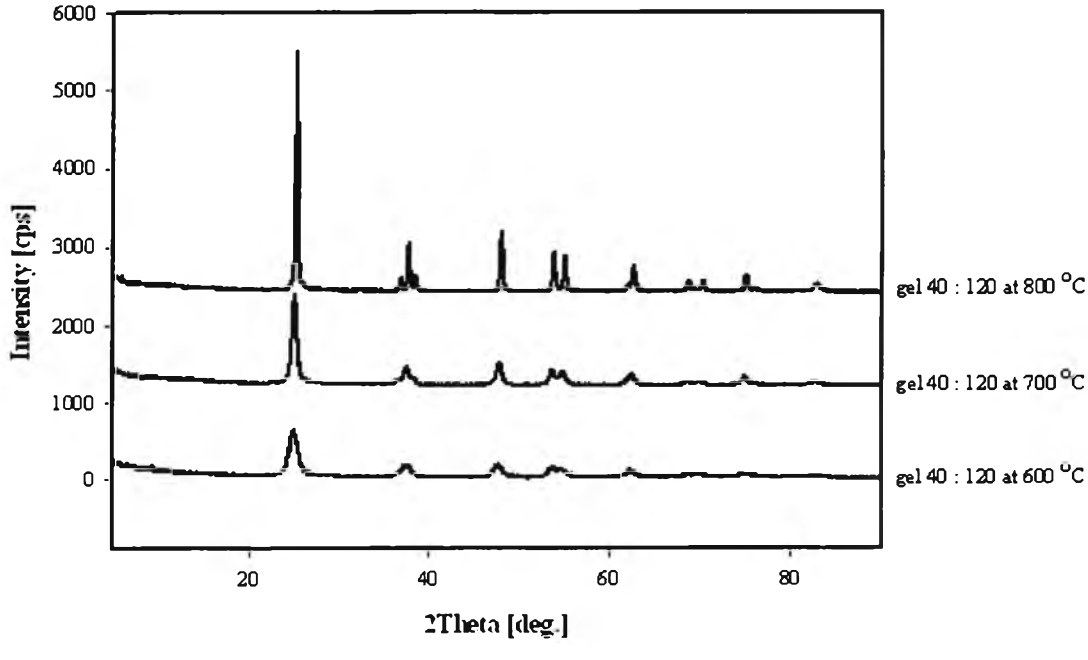


(f) Calcined at 1100 °C

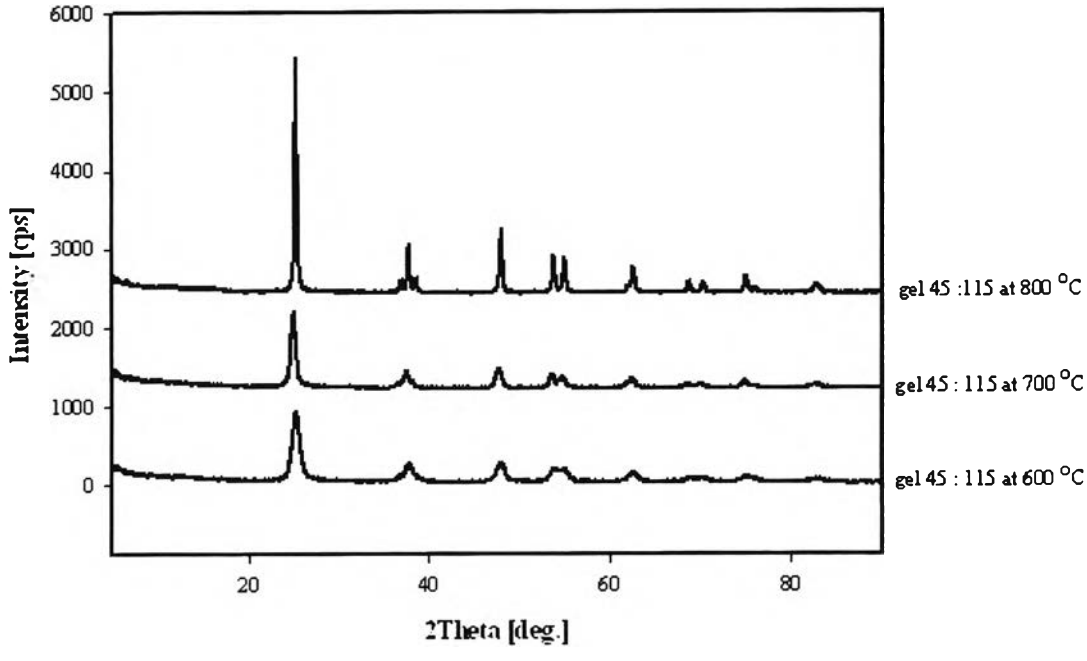
Appendix B XRD patterns of titania powder calcined at different temperatures and different hydrochloric acid and water ratios, a) 0.28, b) 0.33, c) 0.39 and d) 0.45.



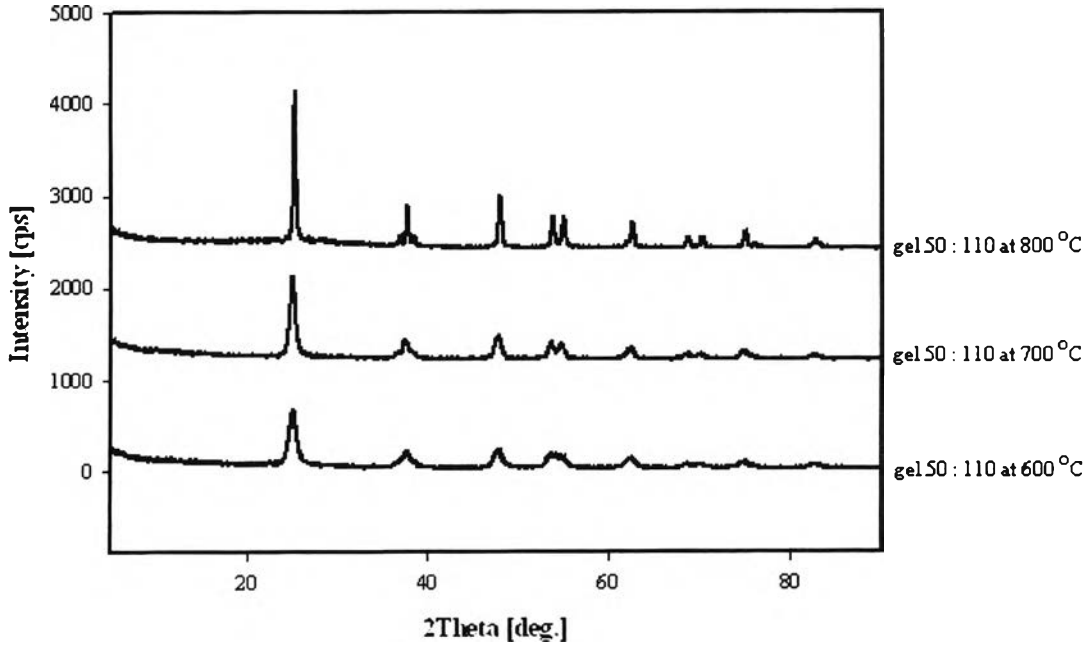
(a) Titania powder at HCl:H_2O ratio 0.28



(b) Titania powder at HCl:H_2O ratio 0.33



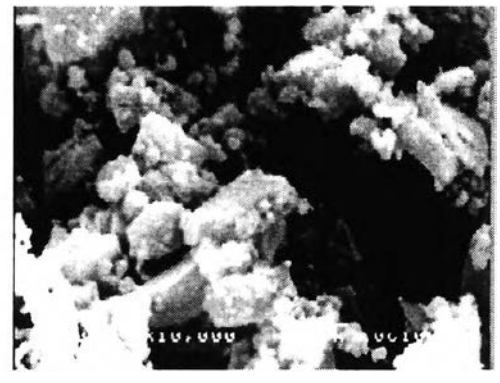
(c) Titania powder at HCl:H_2O ratio 0.39



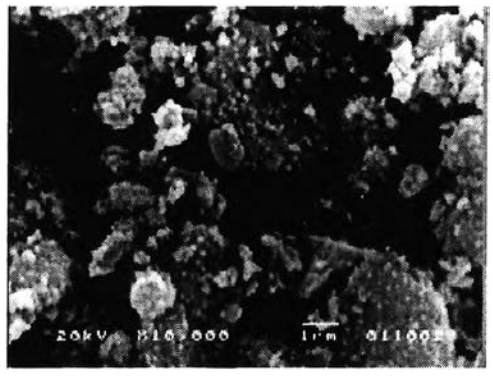
(d) Titania powder at HCl:H_2O ratio 0.45

Appendix C SEM micrographs of titania powder calcined at different temperatures and different hydrochloric acid and water ratios, a-c) 0.28 ratio, 600° to 800°C, d-f) 0.33 ratio, 600° to 800°C, g-i) 0.39 ratio, 600° to 800°C, j-l) 0.45 ratio, 600° to 800°C.

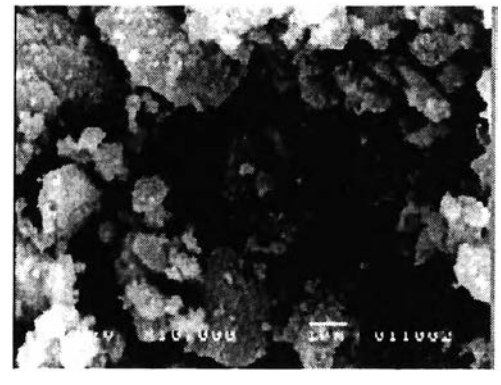
(a) Titania powder 0.28 ratio, 600°C



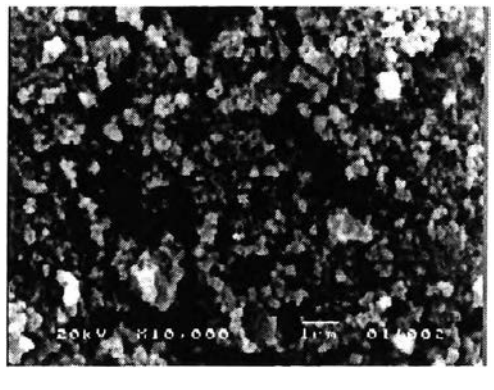
(d) Titania powder 0.33 ratio, 600°C



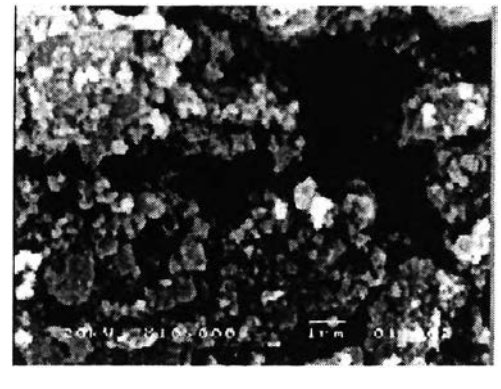
(b) Titania powder 0.28 ratio, 700°C



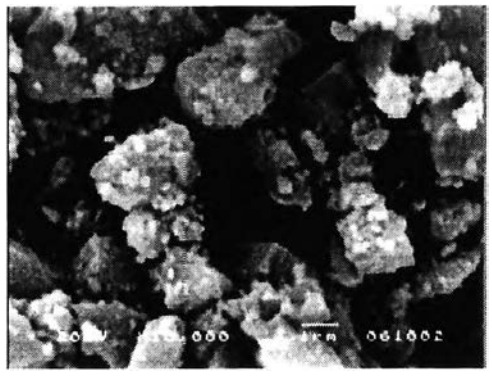
(e) Titania powder 0.33 ratio, 700°C



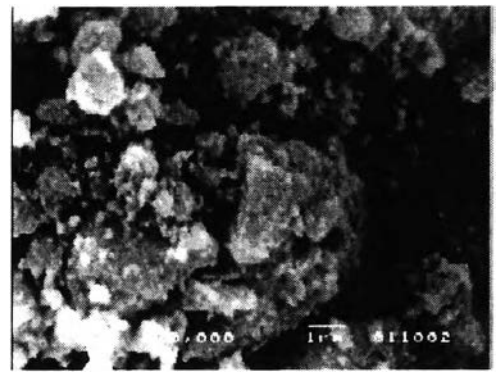
(c) Titania powder at 0.28 ratio, 800°C



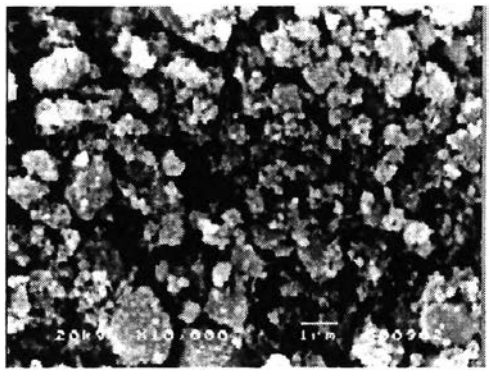
(f) Titania powder at 0.33 ratio, 800°C



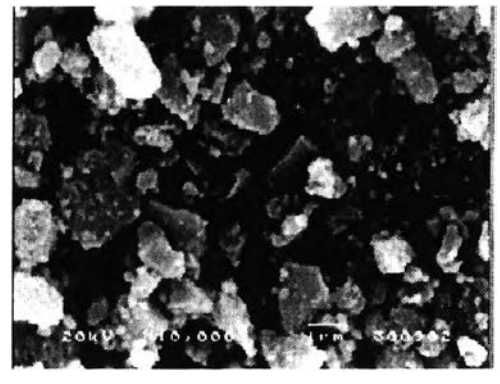
(g) Titania powder at 0.39 ratio, 600°C



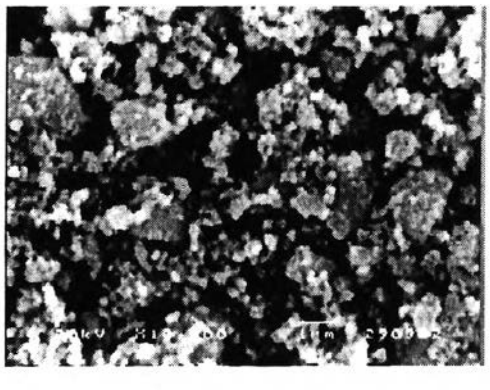
(j) Titania powder 0.45 ratio, 600°C



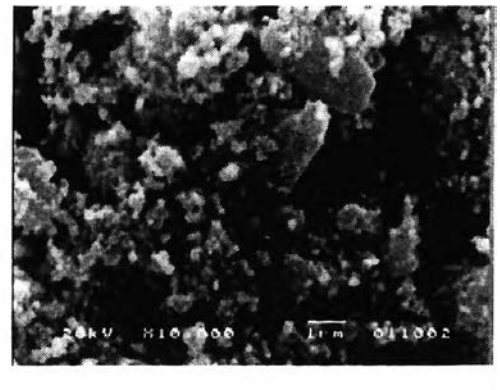
(h) Titania powder at 0.39 ratio, 700°C



(k) Titania powder at 0.45 ratio, 700°C

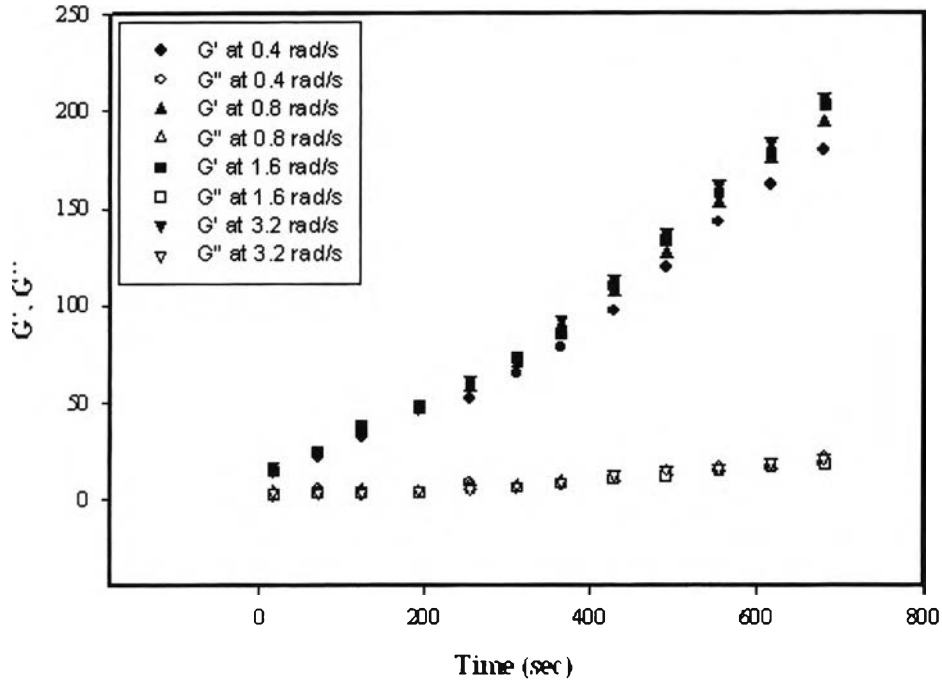


(i) Titania powder at0.39 ratio, 800°C

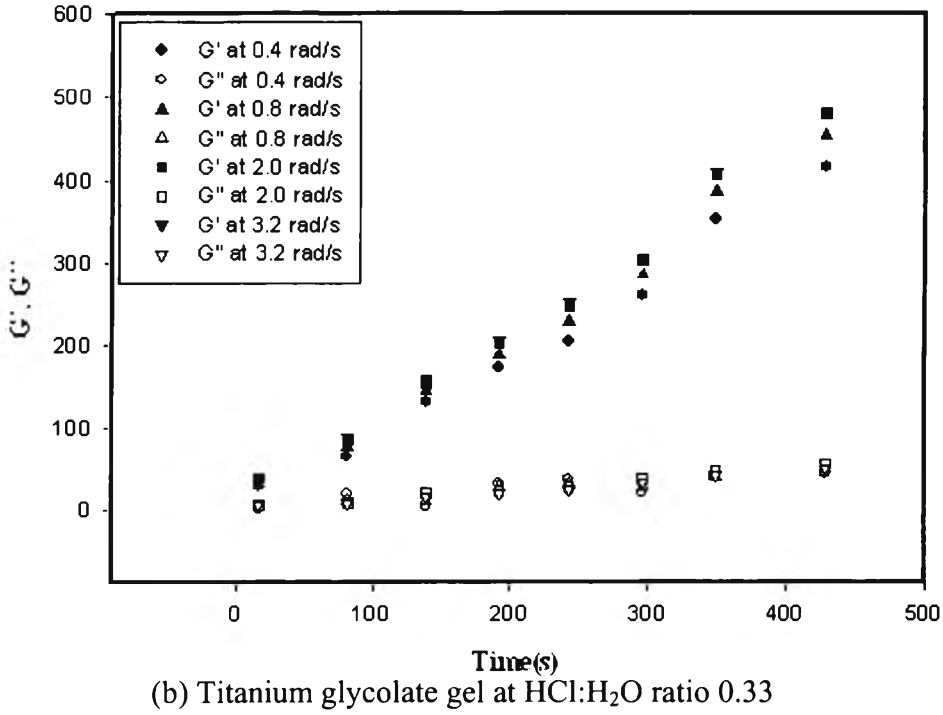


(l) Titania powder at 0.45 ratio, 800°C

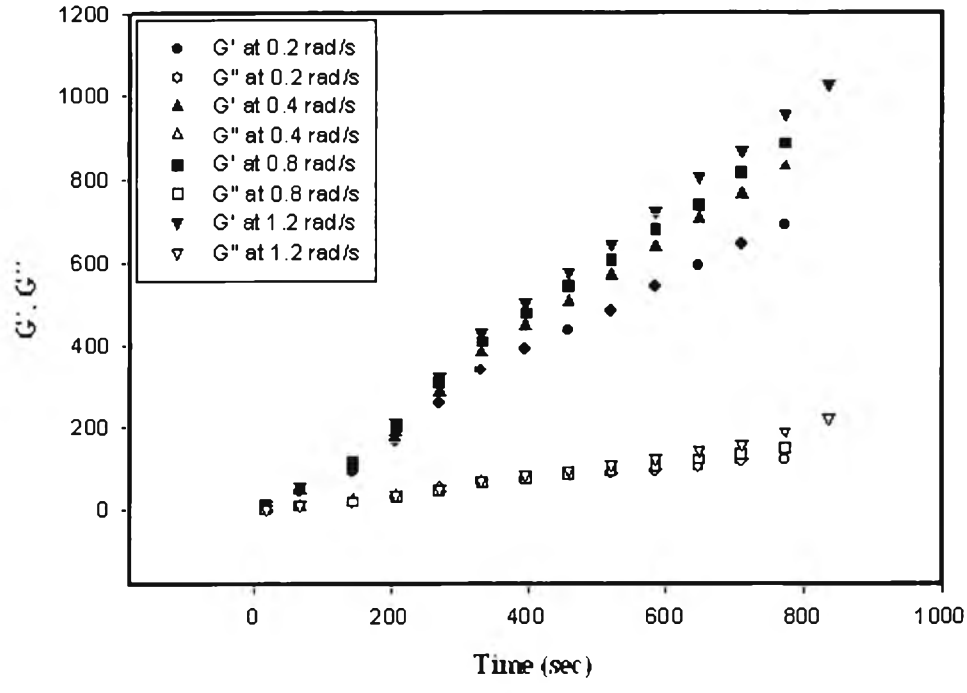
Appendix D The frequency scan of G' and G" of titanium glycolate gel at different hydrochloric acid and water ratios, a) 0.28, b) 0.33, c) 0.39 and d) 0.45



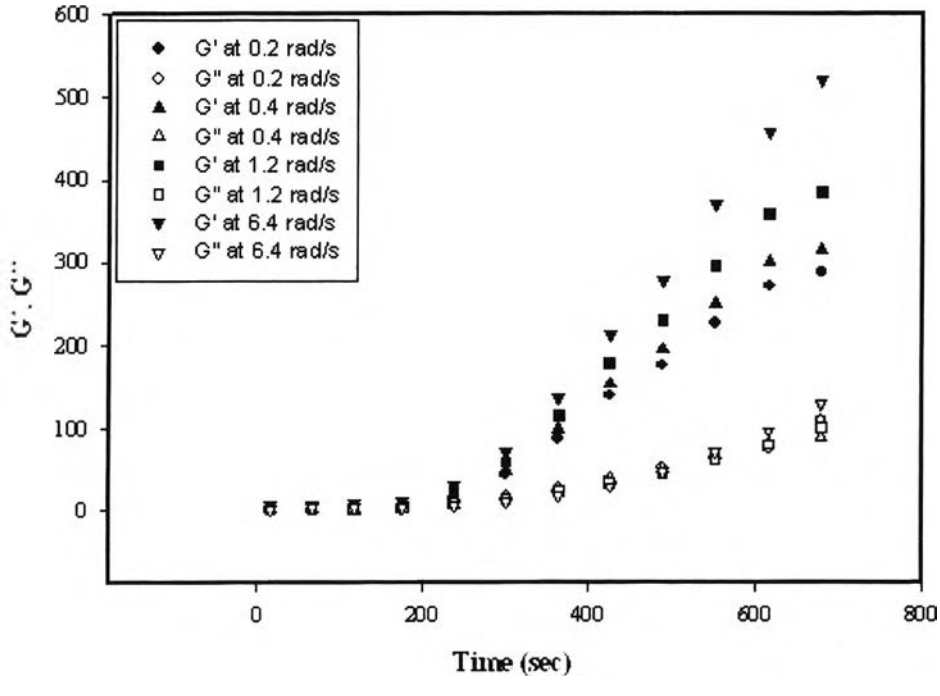
(a) Titanium glycolate gel at HCl:H_2O ratio 0.28



(b) Titanium glycolate gel at HCl:H_2O ratio 0.33

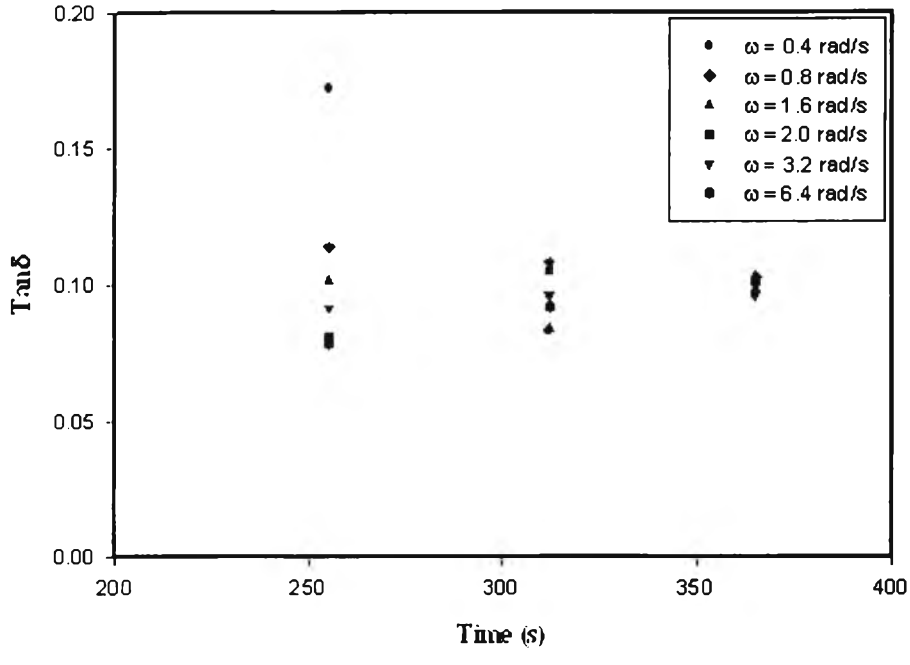


(c) Titanium glycolate gel at HCl:H_2O ratio 0.39

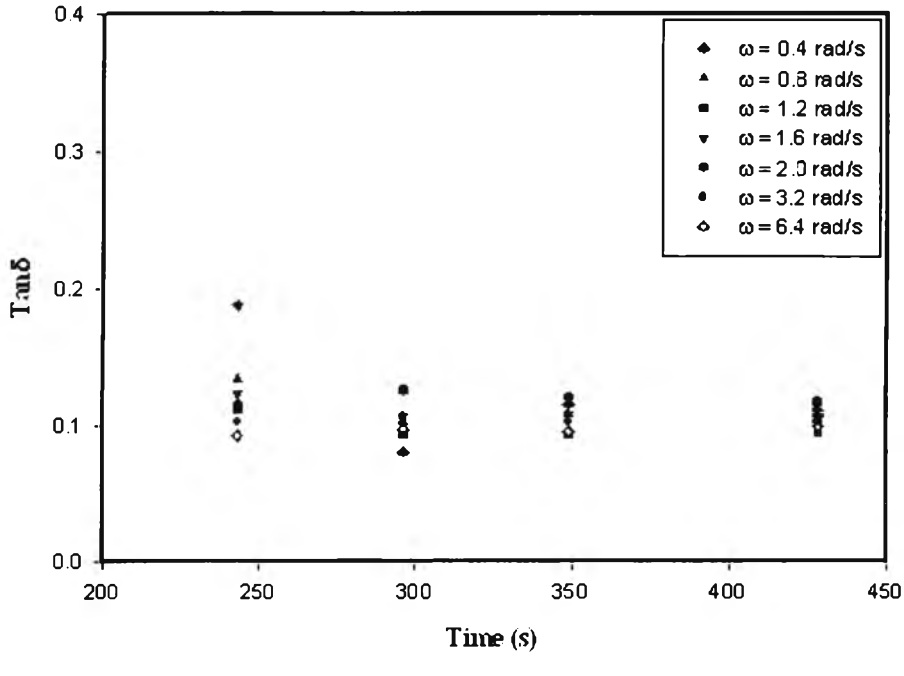


(d) Titanium glycolate gel at HCl:H_2O ratio 0.45

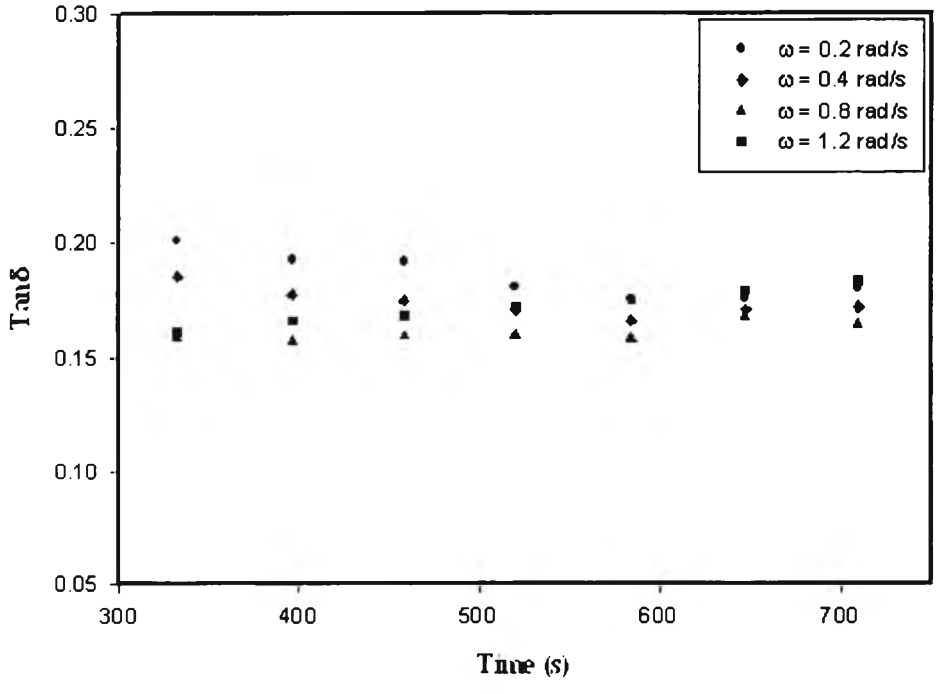
Appendix E The frequency scan of tanδ of titanium glycolate gel at different hydrochloric acid and water ratios, a) 0.28, b) 0.33, c) 0.39 and d) 0.45.



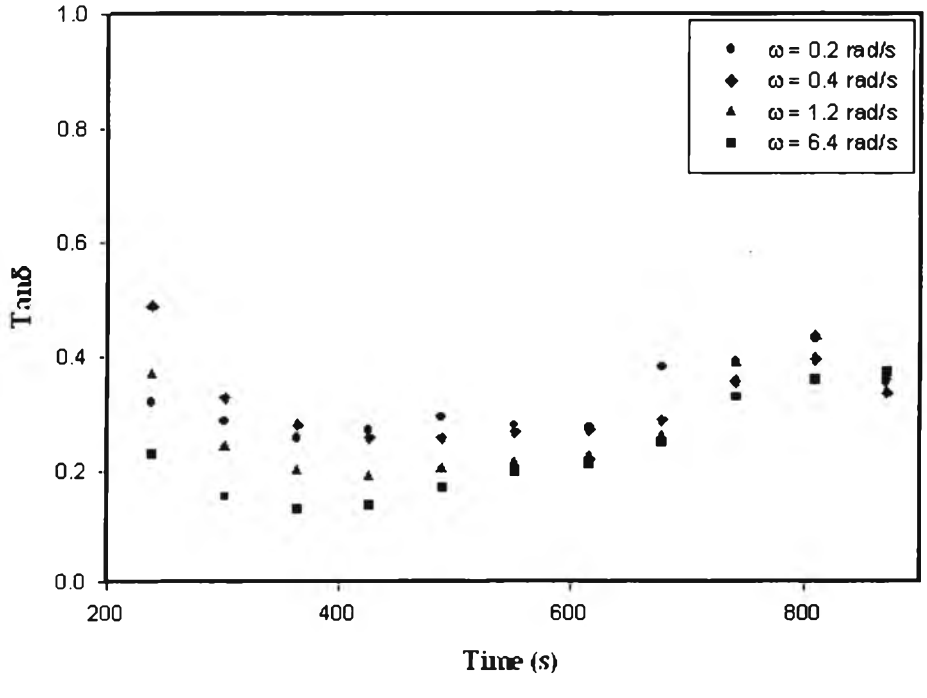
(a) Titanium glycolate gel at HCl:H_2O ratio 0.28



(b) Titanium glycolate gel at HCl:H_2O ratio 0.33



(c) Titanium glycolate gel at HCl:H_2O ratio 0.39



(d) Titanium glycolate gel at HCl:H_2O ratio 0.45

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Publications:

1. Phonthammachai, N., Krissanasaeranee, M., Gulari, E., Jamieson, A.M. and Wongkasemjit, S., Synthesis of High Surface Area and Thermally Stable TiO_2 Directly from Titanium triisopropanolamine Precursor, Mesoporous and Microporous Materials, (Accepted for a presentation at the Micro- and Mesoporous Meeting, Rome, Italy in December, 2004).
2. Phonthammachai, N., Gulari, E., Jamieson, A.M. and Wongkasemjit, S., Photocatalytic Membrane Reactor of a Novel High Surface Area TiO_2, Journal of Membrane Science, (Submitted).
3. Phonthammachai, N., Krissanasaeranee, M., Gulari, E., Jamieson, A.M. and Wongkasemjit, S. Structural and Crystallization of High Titanium Loaded TS-1 Zeolite, Applied Catalysis A: General, (Sumitted).
4. Phonthammachai, N., Rumruangwong, M., Gulari, E., Jamieson, A.M. and Wongkasemjit, S. (2004) Synthesis and Rheological Properties of Mesoporous Nanocrystalline CeO_2 vis Sol-Gel Process, Colloid and Surface A: Physicochemical and Engineering Aspects, 247, 61-68.
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2. Phonthammachai, N., Krissanasaeranee, M., Gulari, E., Jamieson, A.M. and Wongkasemjit, S. (2004) Synthesis of High Surface Area and Thermally Stable TiO_2 Directly from Titanium triisopropanolamine Precursor, Micro- and Mesoporous Meeting, Rome, Italy.