APPENDIX A

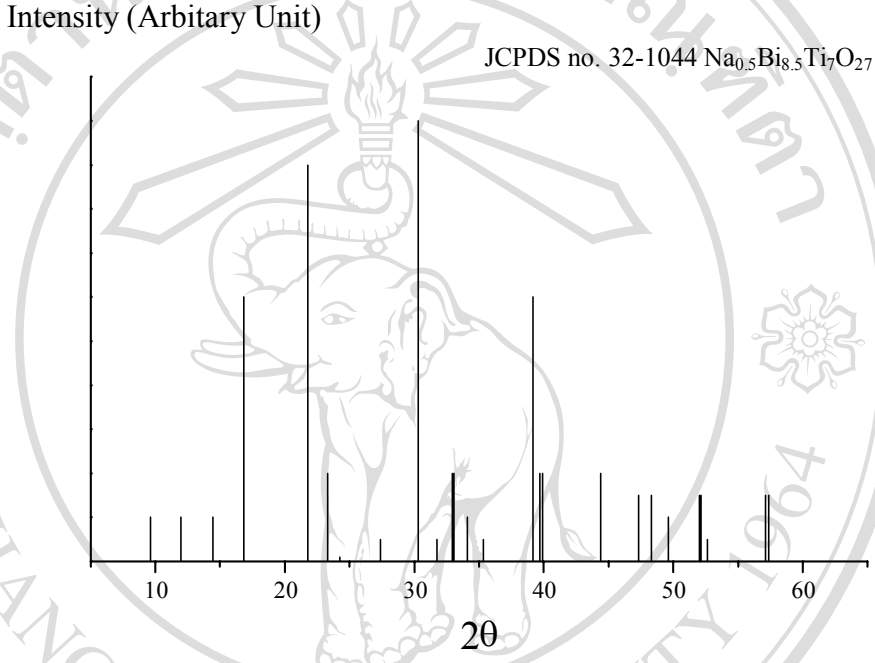

Figure A1 JCPDS file number 32-1044 of BNT powders which has orthorhombic phase

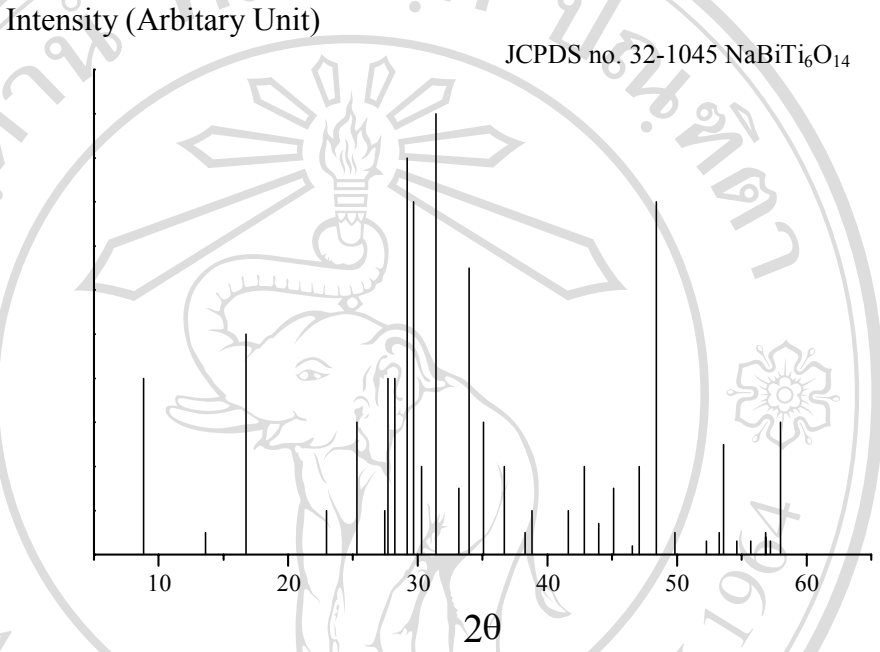

Figure A2 JCPDS file number 32-1045 of BNT powders

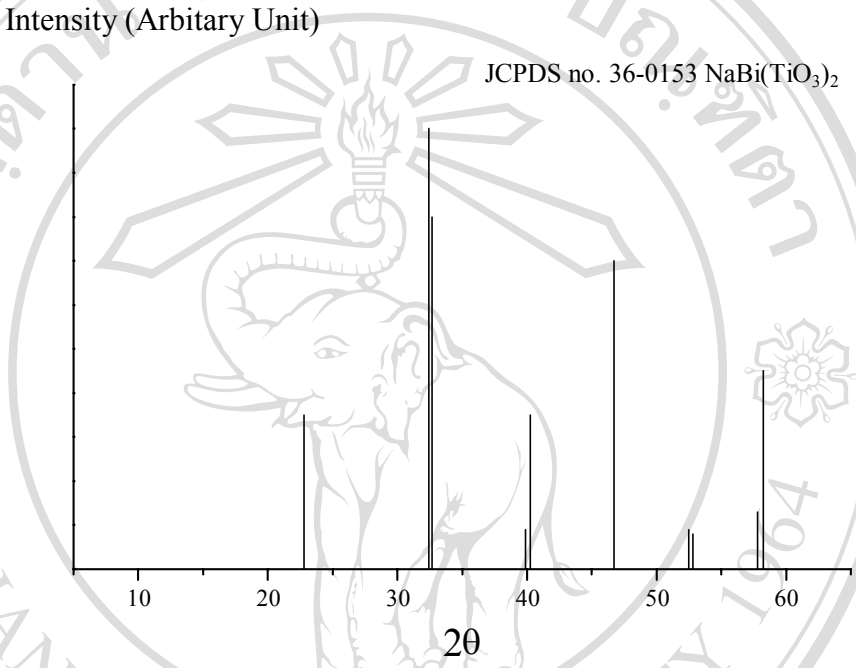

Figure A3 JCPDS file number 36-0153 of BNT powders which has rhombohedral phase

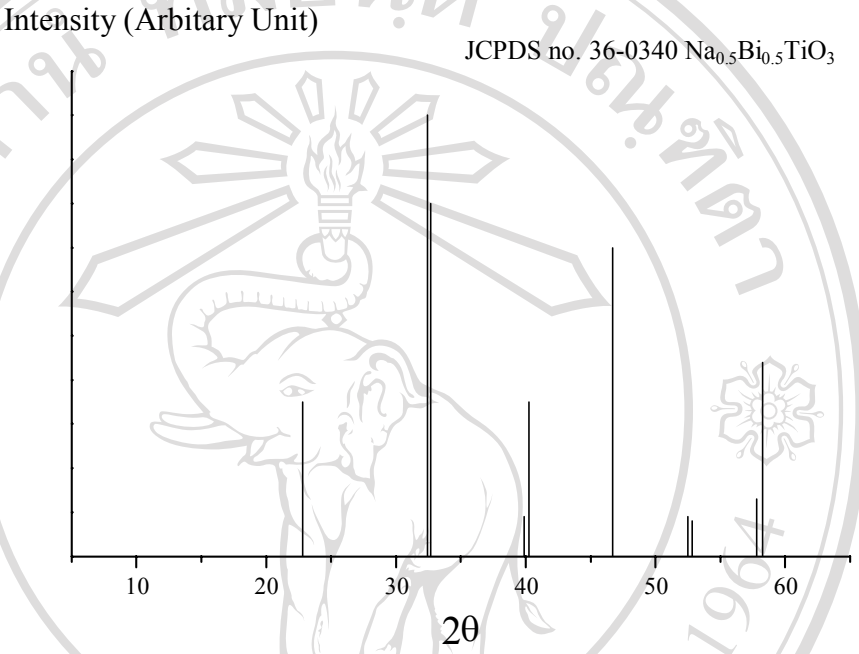

Figure A4 JCPDS file number 36-0340 of BNT powders which has rhombohedral phase

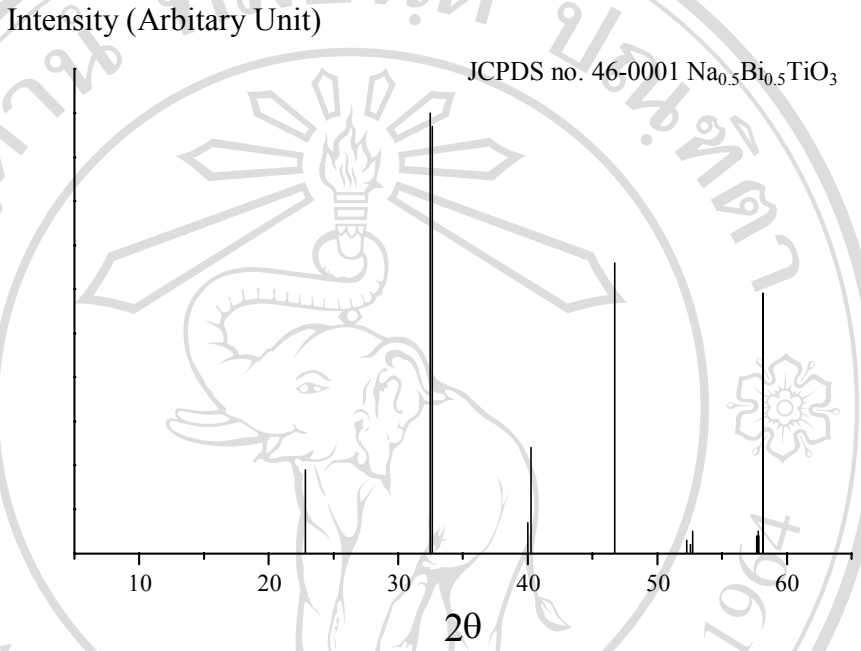

Figure A5 JCPDS file number 46-0001 of BNT powders which has monoclinic phase

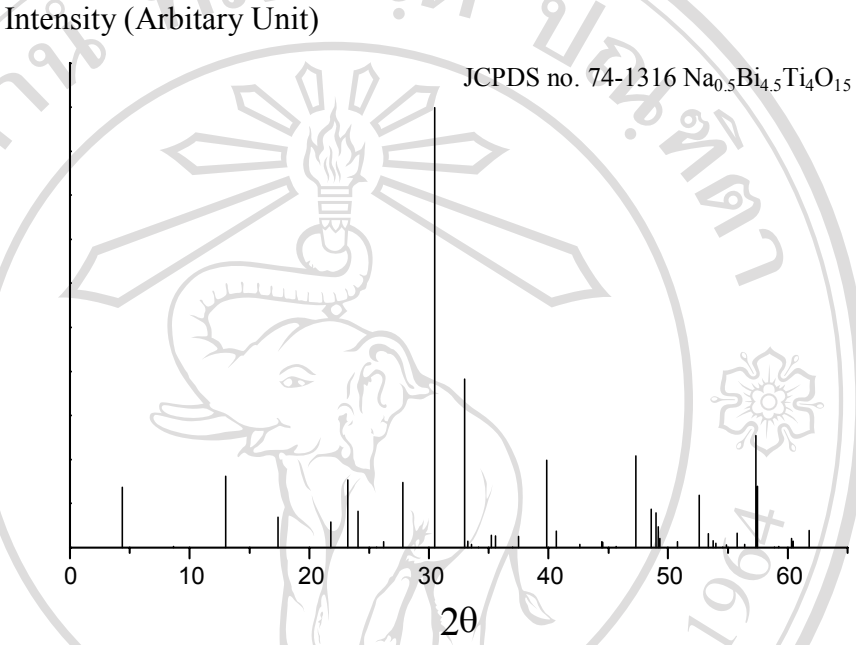

Figure A6 JCPDS file number 74-1316 of BNT powders which has tetragonal phase

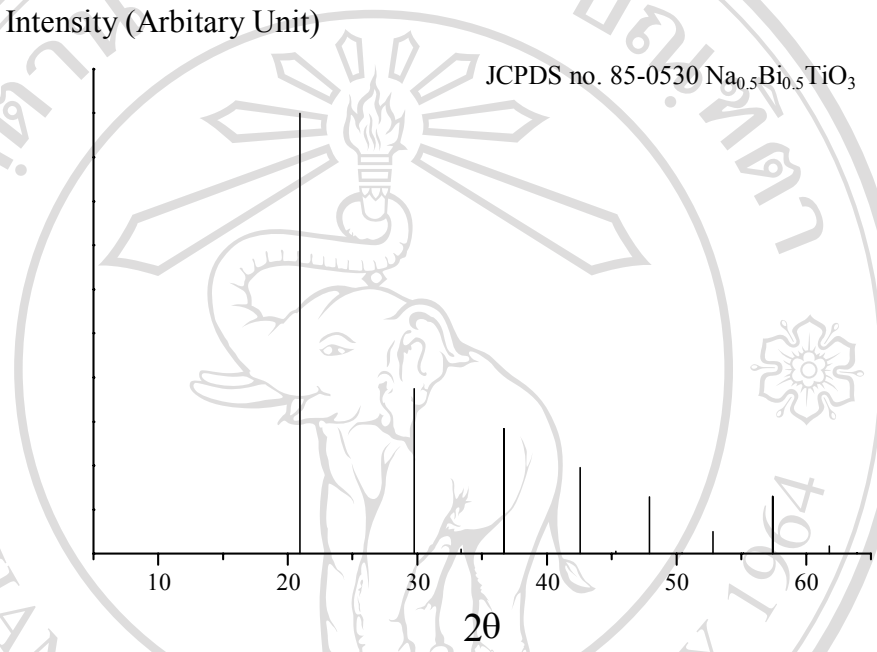

Figure A7 JCPDS file number 85-0530 of BNT powders which has rhombohedral phase

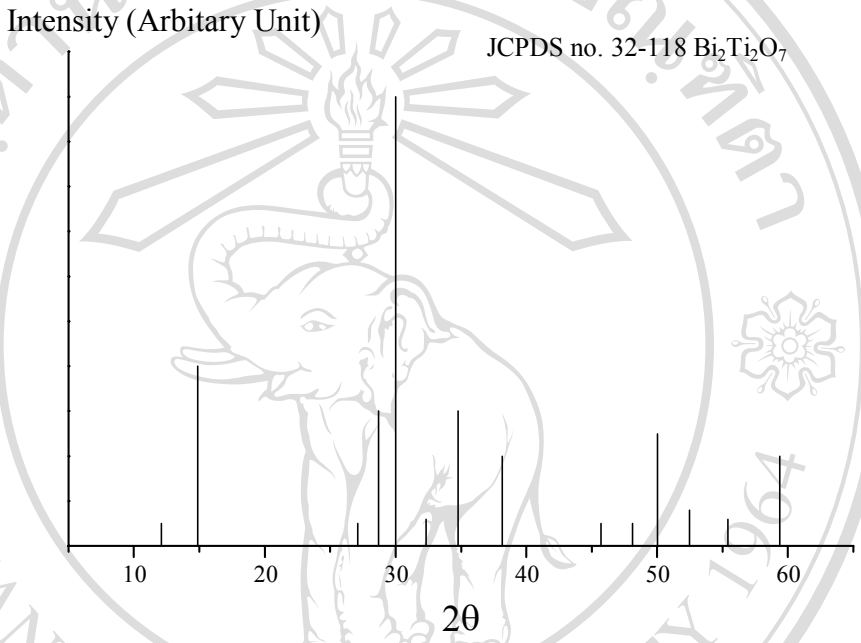

Figure A8 JCPDS file number 32-118 of Bismuth Titanium Oxide which has cubic phase

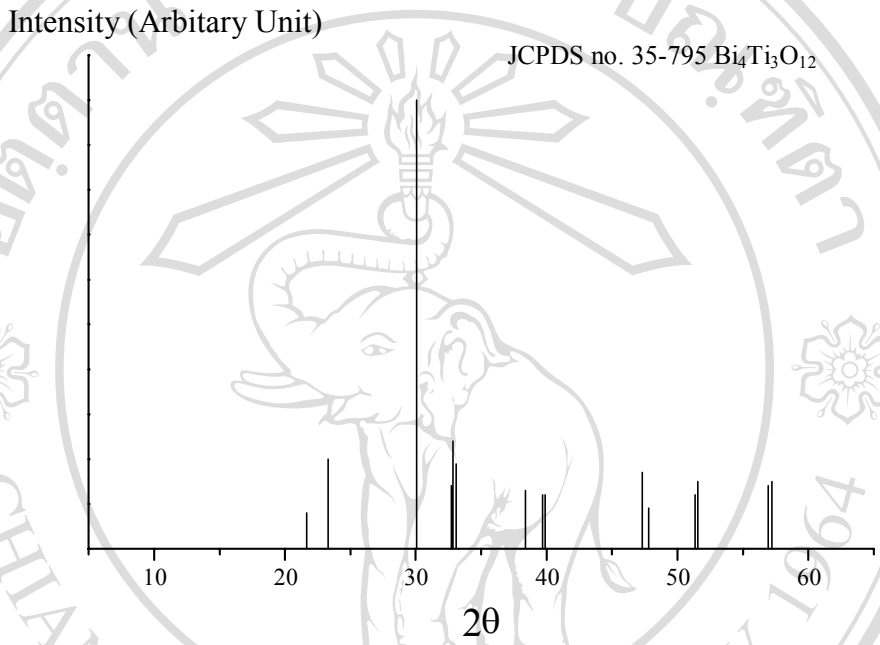

Figure A9 JCPDS file number 35-795 of Bismuth Titanate powders which has orthorhombic phase

VITA

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Award/Scholarships:

1. Best Poster Presentation 1999

   Materials Science: Honorable Prize

   SEM and XRD studies on bismuth sodium titanate powders by a nitrate technique.

   17th Annual Conference of Electron Microscopy Society of Thailand, Chiang Mai.

   7 - 9 December 1999.

2. Graduate School Scholarship, Chiang Mai University, Chiang Mai, 2000

3. Micrograph Awards

   Physical Sciences: SEM: Honorable Prize

   SEM micrograph of BNT ceramic sintered at 1000 ^{o}C for 3 hours.

   2nd NUS – JEOL Electron Microscopy Seminar, Singapore.

   5 - 6 November 2001

4. Poster Presentation Award 2002

   Materials Science: 2nd Prize

   SEM approach to grain size and microstructure of bismuth sodium titanate.

   3rd ASEAN Microscopy Conference and 19th Annual Conference of Electron Microscopy Society of Thailand, Chiang Mai.

   30 January – 1 February 2002.

5. Micrograph Awards 2003

   SEM: Material Science: 2nd Prize

   Spherical bismuth titanate powder synthesized from hydrothermal route.

   20th Annual Conference of Electron Microscopy Society of Thailand, Bangkok.

   29 – 31 January 2003.

6. Micrograph Awards 2004

   SEM: Material Science: 2nd Prize

   Nano-spherical bismuth titanate.

   21st Annual Conference of Electron Microscopy Society of Thailand,

   Ubon-Ratchathani.

   25 – 27 February 2004.

7. Micrograph Awards 2004

   SEM: Material Science: Honorable Prize

   Imperfectly grain growth of BNT ceramic.

   21st Annual Conference of Electron Microscopy Society of Thailand,

   Ubon-Ratchathani.

   25 – 27 February 2004.

List of Publications:

International Journal

1. Pookmanee, P., Phanichphant, S. and Heimann, R. B., Synthesis and properties of bismuth sodium titanate (BNT), Part I: Chemical syntheses and fine single-phase bismuth sodium titanate powders. *cfi/BER.DKG.*, 2001, **78(7),** E27-E30.
2. Pookmanee, P., Phanichphant, S., Straube, U. and Heimann, R. B., Synthesis and properties of bismuth sodium titanate (BNT), Part II: Dielectric properties od sintered BNT and La-doped BNT. *cfi/BER/DKG.*, 2003, **80(11),** E41-E44.
3. Pookmanee, P., Rujijanagul, G., Ananta, S., Heimann, R. B. and Phanichphant, S., Effect of sintering temperature on microstructure of hydrothermally prepared bismuth sodium titanate ceramics. *J. Eur. Ceram. Soc.*, 2004, **24(2)**, 517-520.
4. Pookmanee, P., Uriwilast, P. and Phanichphant, S., Hydrothermal synthesis of fine bismuth titanate powders. *Ceram. Inter.*, 2004, **30(7)**, 1913-1915.

National Journal

1. Pookmanee, P., Rujijanagul, G., Ananta, S. and Phanichphant, S., SEM and XRD studies on bismuth sodium titanate powders by a nitrate technique, *J. E. M. S. T.,* 1999, **13(supplement),** 29-30.
2. Pookmanee, P., Rujijanagul, G., Ananta, S. and Phanichphant, S., Formation and morphology of novel hydrothermal bismuth sodium titanate powders, *J. E. M. S. T.,* 2001, **15(1),** 101-102.
3. Pookmanee, P., Rujijanagul, G., Ananta, S. and Phanichphant, S., SEM approach to grain size and microstructure of bismuth sodium titanate, *J. E. M. S. T.,* 2002, **16(1),** 103-104.
4. Pookmanee, P., Uriwilast, P. and Phanichphant, S., XRD and SEM investigation on bismuth titanate powders synthesized from a low temperature hydrothermal route, *J. E. M. S. T.,* 2003, **17(1),** 29-30.
5. Pookmanee, P., Rujijanagul, G., Ananta, S., Heimann, R. B. and Phanichphant, S., Effect of lanthanum (La) on the microstructure of bismuth sodium titanate (BNT) ceramics, *J. M. S. T.,* 2004, **18(1),** 51-52.

International Conferences

1. Pookmanee, P., Rujijanagul, G., Ananta, S. and Phanichphant, S., Phase and morphology investigation of bismuth sodium titanate (BNT) powders prepared by nitrate route. Poster presentation, 7th Asia-Pacific Electron Microscopy Conference "Perspective Imaging" (7APEM), Singapore. 26 - 30 June 2000.
2. Phanichphant, S., Thavornyutikarn, P., Pookmanee, P., Tunkasiri, T., Rujijanagul, G. and Ananta, S., Novel synthesis of bismuth sodium titanate powders by nitrate route. Poster presentation, 2nd International Conference on Inorganic Materials, Santa Barbara, USA. 13-16 September 2000.
3. Pookmanee, P., Rujijanagul, G., Ananta, S. and Phanichphant, S., SEM approach to grain size and microstructure of bismuth sodium titanate. Poster presentation, 3rd ASEAN Microscopy Conference and 19th Annual Conference of Electron Microscopy Society of Thailand, Chiang Mai. 30 January – 1 February 2002.
4. Pookmanee, P., Rujijanagul, G., Ananta, S., Heimann, R. B. and Phanichphant, S., Effect of sintering temperature on microstructure of hydrothermally prepared bismuth sodium titanate ceramics. Poster presentation, 8th ICCPS 2002 International Conference on Ceramic Processing Science, Hamburg, Germany. 2-5 September, 2002.
5. Pookmanee, P., Uriwilast, P. and Phanichphant, S., Hydrothermal synthesis of fine bismuth titanate powders. Poster presentation, ICMAT 2003 International Conference on Materials for Advanced Technologies, Singapore. 7 – 12 December, 2003.

National Conferences

1. Pookamee, P., Kongtaweelert, S. and Phanichphant, S., Chemical synthesis of bismuth sodium titanate powders by nitrate process. Poster presentation, 25th Congress on Science and Technology of Thailand, Pitsanuloke, 1999, 252-253.
2. Pookmanee, P., Rujijanagul, G., Ananta, S. and Phanichphant, S., SEM and XRD studies on bismuth sodium titanate powders by a nitrate technique. Poster presentation, 17th Annual Conference of Electron Microscopy Society of Thailand, ChiangMai, 1999, 29-30.
3. Pookmanee, P., Ananta, S., Rujijanagul, G., Tunkasiri, T. and Phanichphant, S., Preparation of bismuth sodium titanate fine powders by nitrate route. Poster presentation, The First Thailand Materials Science and Technology Conference, Bangkok, 2000, 461-464.
4. Pookmanee, P., Ananta, S. and Phanichphant, S., Preparation of lead-free perovskite bismuth sodium titanate prepared by nitrate route. Poster presentation, 26th Congress on Science and Technology of Thailand, Bangkok, 2000, 106.
5. Pookmanee, P., Rujijanagul, G., Ananta, S. and Phanichphant, S., Formation and morphology of novel hydrothermal bismuth sodium titanate powders, Poster presentation, 18th Annual Conference of Electron Microscopy Society of Thailand, Khon Kaen, 2001, 101-102.
6. Pookmanee, P., Ananta, S., Rujijanagul, G. and Phanichphant, S., Low temperature hydrothermal synthesis of fine perovskite bismuth sodium titanate powders. Oral presentation, 27th Congress on Science and Technology of Thailand, Songkla, 2001, 147.

7. Pookmanee, P., Rujijanagul, G., Ananta, S., Heimann, R. B. and Phanichphant, S., Low temperature hydrothermal synthesis and characterization of bismuth sodium titanate. Poster presentation, The Second Thailand Materials Science and Technology Conference, Bangkok, 2002, 461-464

8. Pookmanee, P., Ananta, S., Rujijanagul, G., Heimann, R. B. and Phanichphant, S., Characterization of bismuth sodium titanate powders and ceramics synthesized by hydrothermal route. Poster presentation, 28th Congress on Science and Technology of Thailand, Bangkok, 2002, 113.

9. Pookmanee, P., Uriwilast, P. and Phanichphant, S., XRD and SEM investigation on bismuth titanate powders synthesized from a low temperature hydrothermal route. Poster presentation, 20th Annual Conference of Electron Microscopy Society of Thailand, Bangkok, 2003, 29-30.

10. Pookmanee, P., Rujijanagul, G., Ananta, S., Heimann, R. B. and Phanichphant, S., Effect of lanthanum (La) on the microstructure of bismuth sodium titanate (BNT) ceramics. Poster presentation. 21st Annual Conference of Electron Microscopy Society of Thailand, Ubon-Ratchathani, 2004, 51-52.