

## 6. เอกสารอ้างอิง

- [1] Moulson, A.J. and Herbert, J.M. *Electroceramics: Materials, Properties, Applications*, John Wiley & Sons Ltd., Chichester, 2003.
- [2] Haertling, G.H. 1999. Ferroelectric Ceramics: History and Technology. *J. Am. Ceram. Soc.* **82 (4)**: 797-818.
- [3] Maeder, M.D., Damjanovic, D. and Setter N. 2004. Lead Free Piezoelectric Materials. *J. Electroceramics.* **13**: 385-392.
- [4] Ringgaard, E. and Wurlitzer, T. 2005. Lead-free Piezoceramics Based on Alkali Niobates. *J. Eur. Ceram. Soc.* **25**: 2701-2706.
- [5] Shrout, T. R. and Zhang, S. J. 2007. Lead-free Piezoelectric Ceramics: Alternatives for PZT. *J. Electroceramics.* **19**: 113-126.
- [6] Saito, Y., Takao, H., Tani, T., Nonoyama, T., Takatori, K., Homma, T., Nagaya, T. And Nakamura, M. 2004. Lead-free Piezoceramics. *Nature* **432**: 84-87.
- [7] Jaffe, B., Cook, W.R. and Jaffe, H., *Piezoelectric Ceramics*, Academic Press, 1971.
- [8] Zang, G-Z, Wang, J-F, Chen, H-C, Su, W-B, Wang, C-M, Qi, P., Ming, B-Q, Du J. and Zheng, L-M. 2006. Perovskite  $(\text{Na}_{0.5}\text{K}_{0.5})_{1-x}(\text{LiSb})_x\text{Nb}_{1-x}\text{O}_3$  Lead-free Piezoceramics. *Appl. Phys. Lett.* **88**: 212908-212913.
- [9] Guo, Y., Kakimoto, K. and Ohsato, H. 2004. Phase Transition Behavior and Piezoelectric Properties of  $(\text{Na}_{0.5}\text{K}_{0.5})\text{NbO}_3\text{-LiNbO}_3$  Ceramics. *Appl. Phys. Lett.* **85(18)**: 4121-4123.
- [10] Guo, Y., Kakimoto, K. and Ohsato, H. 2005.  $(\text{Na}_{0.5}\text{K}_{0.5})\text{NbO}_3\text{-LiTaO}_3$  Lead-free Piezoelectric Ceramics. *Mater. Lett.* **59(2-3)**: 241-244.
- [11] Zang, G.Z., Wang, J.F., Chen, H.C., Su, W.B., Wang, C.M., Qi, P. Ming, B.Q., Du, J. and Zheng, L.M. 2006. Perovskite  $(\text{Na}_{0.5}\text{K}_{0.5})_{(1-x)}\text{LiSb}_x\text{Nb}_{(1-x)}\text{O}_3$  Lead-free Piezoceramics. *J. Appl. Phys.*, **100(10)**: 104108-104111.
- [12] Chu, S-Y, Water, W., Juang, Y-D and Liaw, J-T 2003. Properties of  $(\text{Na}, \text{K})\text{NbO}_3$  and  $(\text{Li}, \text{Na}, \text{K})\text{NbO}_3$  Ceramic Mixed Systems. *Ferroelectrics.* **283**: 23-33.
- [13] Klein, N., Hollenstein, E., Danjanovic, D.H., Trodahl, J., Setter, N. and Kuball, M. 2007. A Study of the Phase Diagram of  $(\text{K}, \text{Na}, \text{Li})\text{NbO}_3$  Determined by Dielectric and Piezoelectric measurements, and Raman spectroscopy *J. Appl. Phys.* **102**., 14112-14120.

- [14] Song, H-C, Cho, K-H, Park, H-Y, Ahn, C-W, Nahm, S., Uchino, K., Park, S-H and Lee, H-G. 2007. Microstructure and Piezoelectric Properties of  $(1-x)(\text{Na}_{0.5}\text{K}_{0.5})\text{NbO}_3-x\text{LiNbO}_3$  Ceramics. *J. Am. Ceram. Soc.* **90(6)**: 1812-1816.
- [15] Jaeger, R.E. and Egerton, L. 1962. Hot Pressing of Potassium-Sodium Niobate. *J. Am. Ceram. Soc.* **45(5)**: 209-213.
- [16] Wang, R., Xie, R., Sekiya, T., Shimoto, Y., Akimune, Y., Hirosaki, N. and Itoh, M. 2002. Piezoelectric Properties of Spark-Plasma-Sintered  $(\text{Na}_{0.5}\text{K}_{0.5})\text{NbO}_3\text{-PbTiO}_3$  Ceramics. *Jpn. J. Appl. Phys.* **41**: 7119-7122.
- [17] Yu, C.S. and Hsieh, H.L. 2005. Piezoelectric Properties of  $\text{Pb}(\text{Ni}_{1/3},\text{Sb}_{2/3})\text{O}_3\text{-PbTiO}_3\text{-PbZrO}_3$  Ceramics Modified with  $\text{MnO}_2$  Additive. *J. Eur. Ceram. Soc.* **25**: 2425-2427.
- [18] Moon, J.H., Jang, H.M. and You, B.D. 1993. Densification Behaviors and Piezoelectric Properties of  $\text{MnO}_2$ ,  $\text{SiO}_2$ -doped  $\text{Pb}(\text{Ni}_{1/3}\text{Nb}_{2/3})\text{O}_3\text{-PbTiO}_3\text{-PbZrO}_3$  Ceramics. *J. Mater. Res.* **8**: 3184-3191.
- [19] Li, E., Kakemoto, H., Wada, S. and Tsurumi, T. 2007. Effects of Manganese Addition on Piezoelectric Properties of the  $(\text{K,Na,Li})(\text{Nb,Ta,Sb})\text{O}_3$  Lead-free Ceramics. *J. Ceram. Soc. Jpn.*, **115**: 250-253.
- [20] Ahn, C.W., Park, C.S., Choi, C.H., Nahm, S., Yoo, M.J., Lee, H.G. and Priya, S. 2009. Sintering Behavior of Lead-Free  $(\text{K,Na})\text{NbO}_3$ -Based Piezoelectric Ceramics. *J. Am. Ceram. Soc.* **92**: 2033-2038.
- [21] Wu, H. and Davies, P.K. 2006. Influence of Non-Stoichiometry on the Structure and Properties of  $\text{Ba}(\text{Zn}_{1/3}\text{Nb}_{2/3})\text{O}_3$  Microwave Dielectrics: II. Compositional Variations in Pure BZN. *J. Am. Ceram. Soc.* **89**: 2250-2263.
- [22] Lee, Y.H., Cho, J.H. Kim, B.I. and D.K. Choi. 2008. Piezoelectric Properties and Densification Based on Control of Volatile Mass of Potassium and Sodium in  $(\text{K}_{0.5}\text{Na}_{0.5})\text{NbO}_3$  Ceramics. *Jpn. J. Appl. Phys.* **47**: 4620-4622.
- [23] Zhang, Z., Hu, C., Xiong, Y., Yang, R., Wang, Z., 2007. Synthesis of Ba-doped  $\text{CeO}_2$  Nanowires and Their Application as Humidity Sensors. *Nanotechnology*. **18** : 465504-465509.
- [24] Reneker, D.H. and Chun, I., 1966. Nanometer Diameter Fibers of Polymer, Produced by Electrospinning. *Nanotechnology*, **7**:216-223.
- [25] Barakat, N.A.M., Khil, M.S., Sheikh, F.A. and Kim, H.Y.2008. Synthesis and Optical Properties of Two Cobalt Oxides ( $\text{CoO}$  and  $\text{Co}_3\text{O}_4$ ) Nanofibres Produced by Electrospinning Process, *J. Phys. Chem. C.* **112**: 12225–12233.

- [26] Larsen, G., Ortiz, R.V., Minchow, K., Barrero, A. and Loscertales, I.G. 2003. A Method for Making Inorganic and Hybrid (organic/inorganic) Fibers and Vesicles with Diameters in the Submicrometer and Micrometer Range via Sol-Gel Chemistry and Electrically Forced Liquid Jets, *J. Am. Chem. Soc.* **125**: 1154–1155.
- [27] Dai, H.Q., Gong, J., Kim, H. and Lee, D. 2002. A Novel Method for Preparing Ultra-fine Alumina-Borate Oxide Fibres via an Electrospinning Technique, *Nanotechnology* **13**: 674–677.
- [28] Zhang, H., Zhou, Y. Kam, C.H., Cheng, S. Han, X. Lam, Y.L. and Chan, Y.C. 2000. Preparation and Characterization of Sol-Gel Derived Potassium Lithium Niobate. *J. Cryst. Growth.* 211:82-85.
- [29] Fridrikh, S.V., Yu, J.H., Brenner, M.P. and Rutledge, G.C. 2003. Controlling the Fiber Diameter during Electrospinning *Phys. Rev. Lett.* **90**: 144502.
- [30] Dharmaraj, N., Kim, C.H. and Kim, H.Y. 2005. Pb(Zr<sub>0.5</sub>, Ti<sub>0.5</sub>)O<sub>3</sub> Nanofibres by Electrospinning. *Mater. Lett.* **59**: 3085-3089.
- [31] Handoko, A.D. and Goh, G.K.L. 2011. Hydrothermal Synthesis of Epitaxial Na<sub>x</sub>K<sub>(1-x)</sub>NbO<sub>3</sub> Solid Solution films. *Thin Solid Films*, **519**: 5156-5160.
- [32] Nakashima, Y., Sakamoto, W. and Yogo, T. 2011. Processing of Highly Oriented (K,Na)NbO<sub>3</sub> Thin Films Using a Tailored Metal-Alkoxide Precursor Solution *J. Eur. Ceram. Soc.*, **31**: 2497-2503.
- [33] Shirane, G., Danner, H., Pavlovic, A. and Pepinsky, R. 1954. Phase Transitions in Ferroelectric KNbO<sub>3</sub>. *Phys. Rev.*, **93(4)**: 672–673.
- [34] Egerton, L. and Dillon, D.M. 1959. Piezoelectric and Dielectric Properties of Ceramics in the System Potassium-Sodium Niobate. *J. Am. Ceram. Soc.*, **42(9)**: 438–442.
- [35] Tennery, V.J. and Hang, K.W. 1968. Thermal and X-Ray Diffraction Studies of the NaNbO<sub>3</sub>-KNbO<sub>3</sub> System. *J. Appl. Phys.*, **39(10)**: 4749–4753.
- [36] Ahtee, M. and Glazer, A.M. 1974. Phase Transitions in Sodium Niobate-Potassium Niobate Solid Solutions. *Ferroelectrics.* **7**: 93-95.
- [37] Singh, K., Lingwal, V., Bhatt, S.C., Oanwar, N.S. and Semwal, B.S., 2001. Dielectric Properties of Potassium Sodium Niobate Mixed System. *Mater. Res. Bull.* **36**: 2365-2374.

- [38] Burton, B.P. and Nishimatsu, T. 2007. First Principles Phase Diagram Calculations for the System  $\text{NaNbO}_3\text{--KNbO}_3$ : Can Spinodal Decomposition Generate Relaxor Ferroelectricity? *Appl. Phys. Lett.* **91**: 092907-092910.
- [39] Telleir, J. Malic, B. Dkhil, B., Jenko, D., Cilensek, J. and Kosec, M. 2009. Crystal Structure and Phase Transition of Sodium Potassium Niobate Perovskite. *Solid State Sci.* **11**: 320-324.
- [40] Kosec, M. and Kolar, D. 1975. On Activated Sintering and Electrical Properties of  $\text{NaKNbO}_3$ . *Mat. Res. Bull.*, **10(5)**: 335–340.
- [41] Ahn, Z.S. and Schulze, W. A. 1987. Conventionally Sintered  $(\text{Na}_{0.5}\text{K}_{0.5})\text{NbO}_3$  with Barium Additions. *J. Am. Ceram. Soc.*, **70(1)**: C18–C21.
- [42] Guo, Y., Kakimoto, K. and Ohsato, H. 2004. Dielectric and Piezoelectric Properties of Lead-Free  $(\text{Na}_{0.5}\text{K}_{0.5})\text{NbO}_3\text{--SrTiO}_3$  Ceramics. *Solid State Commun.*, **129(5)**: 279–284.
- [43] Kosec, M., Bobnar, V., Hrovat, M., Bernard, J., Malic, B., and Holc, J., 2004. New Lead Free Relaxors Based on the  $\text{K}_{0.5}\text{Na}_{0.5}\text{NbO}_3\text{--SrTiO}_3$  Solid Solution. *J. Mater. Res.* **19(6)**:1849–1854.
- [44] Hollenstein, E., Davis, M., Damjanovic, D., and Setter, N. 2005. Piezoelectric Properties of Li- and Ta-modified  $(\text{K}_{0.5}\text{Na}_{0.5})\text{NbO}_3$  Ceramics. *Appl. Phys. Lett.*, **87(18)**: 182905-182908.
- [45] Matsubara, M., Kikuta, K. and Hirano, S. 2005. Piezoelectric Properties of  $(\text{K}_{0.5}\text{Na}_{0.5})(\text{Nb}_{1-x}\text{Ta}_x)\text{O}_3\text{--K}_{5.4}\text{CuTa}_{10}\text{O}_9$  Ceramics. *J. Appl. Phys.*, **97(11)**: 114105-114112.
- [46] Chen, R. and Li, L. 2006. Sintering and Electrical Properties of Lead Free  $(\text{K}_{0.5}\text{Na}_{0.5})\text{NbO}_3$  Piezoelectric Ceramics. *J. Am. Ceram. Soc.*, **89(6)**: 2010-2015.
- [47] Ahn, C.W., Song, H.C., Nahm, S., Park, Uchino, S.H., Priya, K., Lee, H.G. and Nam Lee, K. 2005. Effect of  $\text{MnO}_2$  on the Piezoelectric Properties of  $(1-x)\text{K}_{0.5}\text{Na}_{0.5}\text{NbO}_3\text{--xBaTiO}_3$  Ceramics. *Jpn. J. Appl. Phys.* **44**: L1361-L1364.
- [48] Du, H., Liu, D., Tang, F., Zhu, D. and Wancheng, A., Microstructure, Piezoelectric, and Ferroelectric Properties of  $\text{Bi}_2\text{O}_3$ -added  $(\text{K}_{0.5}\text{Na}_{0.5})\text{NbO}_3$  Lead Free Ceramics. *J. Am. Ceram. Soc.* **90**: 2824-2829.
- [49] Zhao, P., Zhang, B.-P. and Li, J.-F. 2007. High Piezoelectric  $d_{33}$  Coefficient in Li-modified Lead-free  $(\text{Na,K})\text{NbO}_3$  Ceramics Sintered at Optimal Temperature. *Appl. Phys. Lett.*, **90[24]**: 242909-242913.

- [50] Chu, S-Y, Water, W., Juang, Y-D and Liaw, J-T. 2003. Dependence of the Dielectric Constant on Electric Field in  $\text{SrTi}(16\text{O}_{1-x}\text{18O}_x)_3$  at Oxygen Substitution. *Ferroelectrics*. **283**, 23-38.
- [51] Guo, Y., Kakimoto, K. and Ohsato, H., 2004. Phase Transitional Behavior and Piezoelectric Properties of  $(\text{Na}_{0.5}\text{K}_{0.5})\text{NbO}_3\text{-LiNbO}_3$  Ceramics. *Appl. Phys. Lett.* **85(18)**, 4121-4124.
- [52] Klein, N., Hollenstein, E., Danjanovic, D., Trodahl, H.J., Setter, N. and Kuball, M. 2007. A Study of the Phase Diagram of  $(\text{K,Na,Li})\text{NbO}_3$  Determined by Dielectric and Piezoelectric Measurements, and Raman Spectroscopy . *J. Appl. Phys.* **102**, 14112-14120.
- [53] Song, H-C, Cho, K-H, Park, H-Y, Ahn, C-W, Nahm, S., Uchino, K., Park, S-H and Lee, H-G. 2007. Microstructure and Piezoelectric Properties of  $(1-x)(\text{Na}_{0.5}\text{K}_{0.5})\text{NbO}_3\text{-xLiNbO}_3$  Ceramics. *J. Am. Ceram. Soc.* **90(6)**, 1812-1816.
- [54] Liu, T, Ding, A.L., He, X.Y., Zheng, X.S., Qui, P.S. and Cheng, W.X. 2006. Dielectric and Piezoelectric Properties of Mn-doped of  $\text{Sr}_{0.02}(\text{K}_x\text{Na}_{1-x})_{0.96}\text{NbO}_3$  Ceramics. *Phys. Stat. Sol.* **206**: 3861-3867.
- [55] Lv, Y.G., Wang, C.L., Zhang, J.L., Zhao, M.L., Li, M.K. and Wang, H.C. 2008. Modified  $(\text{K}_{0.5}\text{Na}_{0.5})(\text{Na}_{0.9}\text{Ta}_{0.5})\text{NbO}_3$  Ceramics with High  $Q_m$ . *Mater. Lett.* **62**: 3425-3427.
- [56] Bomlai, P., Sinsap, P., Muensit, S. and Milnr, S.J. 2008. Effect of MnO on the Phase Development, Microstructures and Dielectric Properties of  $0.95(\text{K}_{0.5}\text{Na}_{0.5})\text{NbO}_3\text{-0.05LiTaO}_3$  Ceramics. *J. Am. Ceram. Soc.* **91(2)**: 624-627.
- [57] Yin, Q., Yuan, S., Dong, Q. and Tan, C. 2010. Effect of CuO and MnO<sub>2</sub> Doping on Electrical Properties of  $0.92(\text{K}_{0.5}\text{Na}_{0.5})\text{NbO}_3\text{-0.08LiNbO}_3$  under Low-Temperature Sintering. *J. Alloys. Compd.* **491**: 340-343.
- [58] Zhao, P., Zhang, B.P. and Li, J.F. 2007. Enhancing Piezoelectric  $d_{33}$  Coefficient in Li/Ta-Codoped Lead-Free  $(\text{Na,K})\text{NbO}_3$  Ceramics by Compensating Na and K at a Fixed Ratio. *Appl. Phys. Lett.* **91**: 172901-1729004.
- [59] Wu, J.G., Xiao, D.Q., Wang, Y.Y., Zhu, J.G., Wu, L. and Y.H. Jiang, 2007. Effects of K/Na Ratio on the Phase Structure and Electrical Properties of  $(\text{K}_x\text{Na}_{0.96-x}\text{Li}_{0.04})(\text{Nb}_{0.91}\text{Ta}_{0.05}\text{Sb}_{0.04})\text{O}_3$  Lead-Free Ceramics. *Appl. Phys. Lett.* **91**: 252907-252910.

- [60] Zhao, P., Zhang, B.P. and Li, J.F. 2007. High Piezoelectric  $d_{33}$  Coefficient in Li-modified Lead-Free (Na,K)NbO<sub>3</sub> Ceramics Sintered at Optimal Temperature. *Appl. Phys. Lett.* **90**: 242909-242912.
- [61] Dharmaraj, N., Kim, C.H. and Kim, H.Y. 2005. Pb(Zr<sub>0.5</sub>Ti<sub>0.5</sub>)O<sub>3</sub> Nanofibres by Electrospinning. *Mater. Lett.* **59**: 3085-3089.
- [62] Maensiri, S., Nuansing, W., Klinkaewnarong, Loakul, P. and Khemprasit, J. 2006. Nanofibers of Barium Strontium Titanate (BST) by Sol-Gel Processing and Electrospinning. *J. Colloid. Interf. Sci.* **297**: 578-583.
- [63] Sangmanee, M and Maensir, S. 2009. Nanostructure and Magnetic Properties of Cobalt Ferrite (CoFe<sub>2</sub>O<sub>4</sub>) Fabricated by Electrospinning. *Appl. Phys.* **97**: 167-177.
- [64] He, Y., Zhang, T. Zheng, W. Wang, R., Liu, X. Xia, Y. and Zhao, J. 2010. Humidity Sensing Properties of BaTiO<sub>3</sub> Nanofiber Prepared via Electrospinning. *Sensor Actuat. B-Chem.* **146**: 98-102.
- [65] Chen, Y.Q., Zheng, X.J., Feng, X., Dai, S.H. and Zhang, D.Z. 2010. Fabrication of Lead-Free (Na<sub>0.82</sub>K<sub>0.18</sub>)<sub>0.5</sub>Bi<sub>0.5</sub>TiO<sub>3</sub> Piezoelectric Nanofiber by Electrospinning. *Mater. Res. Bull.* **45**: 717-721.
- [66] D. Lin, K.W. Kwok, K.H. Lam and H.L.W. Chan, *J. Phys. D: Appl. Phys.* **40**, (2007) 3500-3505.
- [67] Y. Guo, K. Kakimoto and H. Ohsato, *Solid State Commun.* **129**, 279 (2004).
- [68] Y. Guo, K. Kakimoto and H. Ohsato, *Jpn. J. Appl. Phys.* **43**, 6662 (2004).
- [69] M. Masubara, K. Kikuta and S. Hirano, *Jpn. J. Appl. Phys. Part 1.* **44(1A)**, 258 (2005).
- [70] Q. M. Zhang, J. Zhao, K. Uchino and J. Zheng, *J. Mater. Res.* **12**, (1997) 226-234.
- [71] L.Wang, R.Zuo, L. Liu, I. Su, M. Shi, X. Chu, X. Wang and L. Li. 2011. Preparation and Characterization of Sol-Gel Derived (Li, Ta, Sb) modified (K, Na)NbO<sub>3</sub> Lead-free Ferroelectric Thin Films. *Mater. Chem. Phys.* **130**: 165-169.