

Institute for Superconducting and Electronic Materials

2003 Refereed Publications

Book Chapters

- S.X. Dou "High T_c conductor processing techniques", *Handbook of Superconducting Materials*, (421-448) ed. D Cardwell, University of Cambridge, UK; D. Ginley, NREL, USA, IoP, (2003)
- P.N. Mikheenko, K.K. Uprety and S.X. Dou, "High Temperature Superconductors, C2. BSSCO", *Handbook of Superconducting Materials*, (947-992), ed. D Cardwell, University of Cambridge, UK; D. Ginley, NREL, USA, IoP (2003)

Journal Articles

- J.H. Ahn, G.X. Wang, H.K. Liu and S.X. Dou "Nanoparticle-dispersed PEO polymer electrolytes for Li batteries" *J. Power Sources* **119-121**, 422-426 (2003)
- J.H. Ahn, G.X. Wang, J. Yao, H.K. Liu and S.X. Dou "Tin-based composite materials as anode materials for Li-ion batteries" *J. Power Sources* **119-121**, 45-49 (2003)
- W.M. Chen, W. Chen, S.H. Zhou, H.Y. Ling and S.S. Jiang "Pressing processing diminishes outgrowth and bridging for AgMg/Bi-2223 tapes" *J. of Supercond.* **16, 3**, (495-499) (2003)
- Y. Chen, G.X. Wang, K. Konstantinov, J.H. Ahn, H.K. Liu and S.X. Dou "Studies of the electrochemical properties of nanosize Co_3O_4 oxide as an anode material for lithium-ion batteries" *J. Metastable and Nanocrystalline Mat.* **15- 16**, 625-628 (2003)
- Y. Chen, G.X. Wang, K. Konstantinov, H.K. Liu and S.X. Dou "Synthesis and characterisation of $\text{LiCo}_x\text{Mn}_y\text{Ni}_{1-xy}\text{O}_2$ as a cathode material for secondary lithium batteries" *J. Power Sources* **119-121**, 184-188 (2003)
- E.W. Collings, E. Lee, M.D. Sumption, M. Tomsic, X.L. Wang, S. Soltanian and S.X. Dou "Continuous- and batch processed MgB_2/Fe strands – transport and magnetic properties" *Physica C* **386**, 555-559 (2003)
- F. Darmann, S.X. Dou and C. Cook "Determination of the AC losses of Bi-2223 HTS coils at 77K at power frequencies using a mass boil-off calorimetric technique" *IEEE Trans. On Appl. Supercond.* **13, 1** 1-6 (2003)
- S.X. Dou, J. Horvat, S. Soltanian, X.L. Wang, M.J. Qin, S.H. Zhou, H.K. Liu and P.G. Munroe "Transport critical current density in Fe-sheathed nano-SiC doped MgB_2 Wires" *IEEE Trans. On Appl. Supercond.* **13, 2** 3199-3202 (2003)
- S.X. Dou, A.V. Pan, S. Zhou, M. Ionescu, X.L. Wang, J. Horvat, H.K. Liu and P.R. Munroe "Superconductivity, critical current density, and flux pinning in $\text{MgB}_{2-x}(\text{SiC})_{x/2}$ superconductor after SiC nanoparticle doping" *J. Appl. Phys.* **94, 3**, 1850-1856 (2003)
- S.X. Dou, W.K. Yeoh, J. Horvat and M. Ionescu "Effect of carbon nanotube doping on critical current density of MgB_2 superconductor" *App. Phys. Lett.* **83, 24** 4996-4998 (2003)
- P. Fisher, R.E.M. Vickers and K. Ishida "Coulomb related Landau spectra of axial and double acceptors in germanium" *Phys. Stat. Sol.* **0,2**, 683-686 (2003)
- P. Fisher, R.E.M. Vickers and D.C. Lau "Bulk homogeneous uniaxial stress arising from surface damage of crystalline silicon and germanium" *Surface Rev. and Lett.* **10, 2 & 3** (2003)
- X.K. Fu, P.M. McIntyre, Y.C. Guo, H.K. Liu and S.X. Dou "Critical current density behaviours for sinter-forged Bi- 2223 bulks" *J. Supercond.* **16,3**, 555-560 (2003)
- X.K. Fu, P.M. McIntyre, Y.C. Guo, H.K. Liu and S.X. Dou "The effect of pre-sintering and deformation rate on critical current density behaviour of Bi-2223 bulk samples made by sinter forging" *Supercond. Sci. Technol.* **B 16**, 804-808 (2003)
- M. Fujita, T. Toyoda, J.C. Cao and C. Zhang "Induced charge-density oscillation under a quantizing magnetic field and intense terahertz radiation" *Phy. Rev. B* **67**, 075105-1 – 0751505-5 (2003)
- A. Gandini, R. Weinstein, D. Parks, R.P. Sawh and S.X. Dou "A non-destructive, non-contact, quality test of critical current for Ag-BISCCO tape" *IEEE Trans. On Appl. Supercond.* **13, 2** 3332-3334 (2003)
- A. Gandini, R. Weinstein, D. Parks, R.P. Sawh and S.X. Dou "On the limiting mechanism of irradiation enhancement of I_c " *IEEE Trans. On Appl. Supercond.* **13, 2** 2934-2936 (2003)
- Z.P. Guo, J.H. Ahn, H.K. Liu and S.X. Dou "Manganese-ion doped layered nanocrystalline Li-CoMn-O powders prepared by sol-gel processing" *J. Metastable and Nanocrystalline Mat.* **15-16**, 727-732 (2003)
- Z.P. Guo, K. Konstantinov, G.X. Wang, H.K. Liu and S.X. Dou "Preparation of orthorhombic LiMnO_2 material via the sol-gel process" *J. Power Sources* **119-121**, 221-225 (2003)
- Z.P. Guo, H. Liu, S. Bewlay, H.K. Liu and S.X. Dou "A new synthetic method for preparing LiFePO_4 with enhanced electrochemical performance" *J. New Mat. For Electrochem. Sys.* **6**, 259-262 (2003)

- Z.P. Guo, H. Liu, H.K. Liu and S.X. Dou "Characterisation of layered $\text{Li}[\text{Ni}_{1/3} \text{Mn}_{1/3} \text{Co}_{1/3}] \text{O}_2$ cathode materials prepared by spray-drying method" *J. New Mat. For Electrochem. Sys.* **6**, 263-266 (2003)
- Z.P. Guo, S. Zhong, G.X. Wang, H.K. Liu and S.X. Dou "Structure and electrochemical characteristics of $\text{LiMn}_{0.7}\text{M}_{0.3}\text{O}_2$ (M=Ti, V, Zn, Mo, Co, Mg, Cr)" *J. Alloys & Comp.* **348**, 231-235 (2003)
- Y.S. Han, M.J. Qin, J.K.F. Yau, H.K. Liu, S.X. Dou, C.M. Lee and X. Jin "AC response studying on MgB_2 superconductor by Maley's method" *Physica C* **386**, 631-637 (2003)
- J. Horvat, S. Soltanian, X.L. Wang and S.X. Dou "Magnetic shielding in MgB_2/Fe superconducting wires" *IEEE Trans. On Appl. Supercond.* **13**, 2 3324-3327 (2003)
- M. Ionescu, J. McKinnon, S. Zhou and S.X. Dou "Phase formation and evolution of (Bi,Pb)2223 inside Ag tapes in air and reduced oxygen partial pressure using synchrotron X-rays" *Physica C* **400** 81-88 (2003)
- S.H. Jang, J.H. Lim, J.H. Kim, B.K. Ji, J. Joo, W. Nah, J. S. Volf, H.K. Liu and M. Apperley "Characteriation of thermal conductivity and mechanical properties of Ag-alloy sheathed Bi(Pb)-Sr-Ca-Cu-O superconductor tape" *IEEE Trans. On Appl. Supercond.* **13**, 2 2956-2959 (2003)
- S. Keshavarzi, M.J. Qin, X.L. Wang, H.K. Liu and S.X. Dou "Effects of magnetic field on vortex dynamics in (Tl,Pb)(Sr,Ba)₂Ca₂Cu₃O_y single crystal" *Physica C* **399**, 15-21 (2003)
- K. Konstantinov, J. Wang, S. Bewlay, G.X. Wang, H.K. Liu, S.X. Dou and J.H. Ahn "Spray pyrolysis technique for fabrication of nano-sized spherical agglomerated oxide powders for batteries" *J. Metastable and Nanocrystalline Mat.* **15-16**, 325-330 (2003)
- K. Konstantinov, G.X. Wang, J. Yao, H.K. Liu and S.X. Dou "Stoichiometry-controlled high-performance of LiCoO_2 electrode materials prepared by a spray solution technique" *J. Power Sources* **119-121**, 195-200 (2003)
- X. Leng, S.Y. Ding, Y. Liu, Z.H. Wang, H.K. Liu and S.X. Dou "Dip effect in ac susceptibility due to surface barrier with flux creep" *Phys. Rev. B* **68** 214511-1 – 214511-5 (2003)
- R.A. Lewis and Y.J. Wang "Zeeman spectroscopy of the Zn acceptor in InP" *Solid State Communs.* **126**, 275-280 (2003).
- R.A. Lewis, Y.-J. Wang and M. Henini "Magnetospectroscopy of Be in GaAs" *Phys. Rev. B* **67**, 235204-1 – 235204- 10 (2003)
- A.H. Li, X.L. Wang, S. Soltanian, M. Ionescu, J. Horvat, H.K. Liu and S.X. Dou "Effect of sintering temperature on the microstructure and critical current density of nanocrystalline MgB_2 thick films prepared using very fast formation method" *J. Metastable and Nanocrystalline Mat.* **15-16**, 349-354 (2003)
- G. Li, M.J. Qin, H.K. Liu and S.X. Dou "Effects of the field dependent J_c on the vertical levitation force between a superconductor and a magnet" *IEEE Trans. On Appl. Supercond.* **13**, 2 2142-2145 (2003)
- S. Li, T. White, K. Laursen, T.T. Tan and C.Q. Sun, Z.L. Dong, Y. Li, S.H. Sho, J. Horvat and S.X. Dou "Intense vortex pinning enhanced by semicrystalline defect traps in self-aligned nanostructured MgB_2 " *App. Phys. Lett.* **83**, 2, 314-316 (2003)
- M.J. Lindsay, G.X. Wang and H.K. Liu "Al-based anode materials for Li-ion batteries" *J. Power Sources* **119-121**, 84-87 (2003)
- H.K. Liu, S.H. Zhou, S. Soltanian, J. Horvat, A.V. Pan, M.J. Qin, X.L. Wang, M. Ionescu, S.X. Dou "Effect of Nano-SiC and nano-Si doping on critical current density of MgB_2 " *Tsinghua Sci & Tech.* **6**, **11**, 307-315 (2003)
- H.K. Liu, Z.M. Zhang, R. Zeng, J. Horvat and Miles Apperley "A comparison of Ag and Ag-alloy sheathed Bi-2223 tapes" *IEEE Trans. On Appl. Supercond.* **13**, 2 3004-3007 (2003)
- B.C.C. Lough, S.P. Lee, Z. Dou, R.A. Lewis, C. Zhang "Investigation into space charge effects in I - V characteristics of multi-layer semiconductor thermionic devices" *Physica E* **17**, 651-653 (2003)
- H. Luo, Y. Liu, X. Leng, Z.H. Wang, S.Y. Ding, X.L. Wang and S.X. Dou "Flux motion in new superconductor MgB_2 " *Physica C* **387**, 307-312 (2003)
- D.G. Marinaro, J. Horvat, S.X. Dou, R. Weinstein and A. Gandini "Effects of fission-fragment damage on vortex dimensionality in silver-sheathed $\text{Bi}_2\text{Sr}_2\text{Ca}_2\text{Cu}_3\text{O}_x$ tapes" *Phys. Rev. B* **68**, 0645181-1, 0645181-9 (2003)
- S. Ohshima, K. Ujiiie, T. Kawai, K. Moriai, H. Yamada, D.G. Marinaro and S.X. Dou "Observation of vortex distribution in samples of Bi-2223 Ag-sheathed tapes with and without uranium doping by means of the high-resolution bitter method" *IEEE Trans. On Appl. Supercond.* **13**, 2 2953-2955 (2003)
- A.V. Pan, S.X. Dou and H.K. Liu "Magnetic flux distribution in a superconducting core of Bi-2223 tape" *Physica C* **388-389**, 405-406 (2003)
- A.V. Pan, R. Höhne and Pablo Esquinazi "3D-2D-like vortex transition above B_{c2} in niobium films" *Physica C* **329- 333**, 1377-1378 (2003)
- A.V. Pan, S. Zhou, H.K. Liu and S.X. Dou "Direct visualisation of iron sheath shielding effects in MgB_2 superconducting wires" *Supercond. Sci. Technol.* **16** L33-L36 (2003)
- A.V. Pan, S. Zhou, H.K. Liu and S.X. Dou "Properties of superconducting MgB_2 wires: in situ versus ex situ reaction technique" *Supercond. Sci. Technol.* **16**, 639-644 (2003)

- V.M. Pan, E.A. Pashitskii, S.M. Ryabchenko, V. A. Komashko, A.V. Pan, S.X. Dou, A.V. Semenov, C.G. Tretiatchenko and Y.V. Fedotov "Mechanisms of limitation and nature of field dependence of critical current in HTS epitaxial YBaCuO films" *IEEE Trans. On Appl. Supercond.* **13**, 2 3714-3717 (2003)
- M.J. Qin, G.Li, H.K. Liu and S.X. Dou "Calculation of the temperature dependent AC susceptibility of superconducting disks" *IEEE Trans. On Appl. Supercond.* **13**, 2 3742-3745 (2003)
- L. Shan, H.H. Wen and S.X. Dou "Enhanced flux pinning by isotropic fission tracks on uranium-doped Bi-2223 tapes irradiated by thermal neutrons" *Physica C* **390**, 80-88 (2003)
- D.Q. Shi, M. Ionescu, T.M. Silver and S.X. Dou "Relationship between epitaxial deposition and growth modes of CeO₂ films" *Physica C* **384**, 475-481 (2003)
- S. Soltanian, J. Horvat, X.L. Wang, P. Munroe and S.X. Dou "Effect of nano-carbon particle doping on the flux pinning properties of MgB₂ superconductor" *Physica C* **390**, 185-190 (2003)
- S. Soltanian, J. Horvat, X.L. Wang, M. Tomsic and S.X. Dou "Transport critical current of solenoidal MgB₂/Cu coils fabricated using a wind-reaction in situ technique" *Supercond. Sci. Technol.* **16**, 1, L4-L6 (2003)
- S. Soltanian, M.J. Qin, S. Keshavarzi, X.L. Wang and S.X. Dou "Effect of sample size on the magnetic critical current density in nano-SiC doped MgB₂ superconductors" *Phys. Rev. B* **68**, 134509-1 134509-4 (2003)
- S. Soltanian, X.L. Wang, J. Horvat, M.J. Qin, H.K. Liu, P.R. Munroe and S.X. Dou "Effect of grain size and doping level of SiC on the superconductivity and critical current density in MgB₂ superconductor" *IEEE Trans. On Appl. Supercond.* **13**, 2 3273-3276 (2003)
- E.V. Sotirova-Haralambeva, X.L. Wang, H.K. Liu, T. Silver, K. Konstantinov and J. Horvat "Zinc doping effects on the structure, transport and magnetic properties of La_{0.7}Sr_{0.3}Mn_{1-x}Zh_xO₃ manganite oxide" *Sci. & Tech. Of Adv. Mat.* **4** 149-152 (2003)
- T.T. Tan, S. Li, S.P. Lau, Y.Y. Tay, C.Q. Sun, S.H. Zhou and S.X. Dou "Effects of varying mechanical deformations on the relationship between mesotexture and current percolation in (Bi,Pb)₂Sr₂Ca₂Cu₃O₁₀/Ag superconductor tapes" *Supercond. Sci. Technol.* **16**, 885-892 (2003)
- K.K. Uprety, J. Horvat, X.L. Wang, G.D. Gu, M. Ionescu, H.K. Liu, S.X. Dou and E.H. Brandt "Magnetic hysteresis and relaxation in Bi2212 single crystals doped with Fe and Pb" *IEEE Trans. On Appl. Supercond.* **13**, 2 3770-3773 (2003)
- G.X. Wang, J.H. Ahn, J. Yao, M. Lindsay, H.K. Liu and S.X. Dou "Preparation and characterisation of carbon nanotubes for energy storage" *J. Power Sources* **119-121**, 16-23 (2003)
- G.X. Wang, D. Bradhurst, S.X. Dou and H.K. Liu "LiTi₂(PO₄)₃ with NASICON-type structure as lithium-storage materials" *J. Power Sources* **124**, 231-236 (2003)
- G.X. Wang, S. Bewlay, J. Yao, Y. Chen, Z.P. Guo, H.K. Liu and S.X. Dou "Multiple-ion-doped lithium nickel oxides as cathode material for lithium-ion batteries" *J. Power Sources* **119-121**, 189-194 (2003)
- G.X. Wang, J. Yao, H.K. Liu, S.X. Dou and J.H. Ahn "Nanosized tin microencapsulated graphite as the anode in lithium-ion cells" *J. Metastable and Nanocrystalline Mat.* **15-16**, 739-744 (2003)
- J. Wang, Z.P. Guo, S. Zhong, H.K. Liu and S.X. Dou "Lead-coated glass fibre mesh for lead-acid batteries" *J. App. Electrochem.* **33** 1057-1061 (2003)
- J. Wang, H.K. Liu, S.X. Dou, S. Zhong, Y. Zhu and C. Fu "Enhanced performance of VRLA batteries with a novel spirally-wound electrode design" *J. Power Sources* **113**, 241-244 (2003)
- J. Wang, S. Zhong, K. Konstantinov, J.H. Ahn, H.K. Liu and S.X. Dou "Synthesis of nanocrystalline α -PbO and β - PbO lead oxides for lead-acid battery" *J. Metastable and Nanocrystalline Mat.* **15-16**, 367-372 (2003)
- J. Wang, S. Zhong, H.K. Liu and S.X. Dou "Beneficial effects of red lead on non-cured plates for lead-acid batteries" *J. Power Sources* **113**, 371-375 (2003)
- J. Wang, S. Zhong, X.L. Wang, H.K. Liu, S.X. Dou "A novel cureless paste for positive plates in valve-regulated batteries" *J. Power Sources* **122**, 195-200 (2003).
- X.L. Wang, P.R. Munroe, P. Yao, M. Ionescu, H.K. Liu and S.X. Dou "Effect of nano-Y-ZrO₂ and SiO₂ additions on the microstructure and critical current density of MgB₂ superconductors" *J. Metastable and Nanocrystalline Mat.* **15- 16**, 721-726 (2003)
- X.L. Wang, S.H. Zhou, M.J. Qin, P.R. Munroe, S. Soltanian, H.K. Liu and S.X. Dou "Significant enhancement of flux pinning in MgB₂ superconductor through nano-Si addition" *Physica C* **385**, 461-465 (2003)
- J. Yao, G.X. Wang, J.H. Ahn, H.K. Liu and S.X. Dou "Electrochemical studies of graphitized mesocarbon microbeads as an anode in lithium-ion cells" *J. Power Sources* **114**, 292-297 (2003)
- C. Zhang and B. Lough "Dynamical conductivity of a two-dimensional electron gas under an intense terahertz radiation" *Physica E* **17**, 289-291 (2003)
- Y. Zhao, M. Ionescu, A.V. Pan, S.X. Dou and E.W. Collings "In situ annealing of superconducting MgB₂ films prepared by pulsed laser deposition" *Supercond. Sci. Technol.* **16**, 1487-1492 (2003)

- S. Zhou, H.K. Liu, J. Horvat and S.X. Dou "Effect of Ti doping on the superconductivities of MgB₂/Fe Wires" *J. Low. Temp. Phys.* **131**, 3/4, 687-692 (2003)
- S. Zou, A.V. Pan, H.K. Liu, J. Horvat, X.L. Wang, S.X. Dou "Superconducting properties of MgB₂ superconductor doped with SiC nanopowder" *J. Metastable and Nanocrystalline Mat.* **15-16**, 679-684 (2003)
- S.H. Zhou, A.V. Pan, M.J. Qin, H.K. Liu and S.X. Dou "Effect of the processing parameters of MgB_{1.8}(SiC)_{0.1}/Fe tapes on the critical current density" *Physica C* **387**, 321-327 (2003)

Conference Proceedings`

- C. Freeth and R.A. Lewis "Far-infrared laser magnetospectroscopy of Donors and Acceptors in Ge" *Proc. 27th Annual A&NZIP Cond. Matt. & Mat. Meeting*, 4-7/2/2003, Wagga Wagga, Australia (2003)
- C. Freeth and R.A. Lewis "Selective laser excitation spectroscopy of gallium and phosphorous in germanium" *Conf. on Optoelectronic and Microelectronic Materials and Devices*, 11-13/12/2002, Ed: M. Gal, IEEE Publishing, 447-450 (2003)
- R.A. Lewis, Y.-J. Wang and M. Henini "Magnetospectroscopy of the C line of Be in GaAs" *Proc. 27th Annual A&NZIP Cond. Matt. & Mat. Meeting*, 4-7/2/2003, Wagga Wagga, Australia (2003)
- R.A. Lewis and B.C.C. Lough "Spectroscopic determination of valence band parameters of InP" *Proc. 27th Annual A&NZIP Cond. Matt. & Mat. Meeting*, 4-7/2/2003, Wagga Wagga, Australia (2003)
- B.C.C. Lough, S.P. Lee, Z. Dou, R.A. Lewis and C. Zhang "Thermal and electrical characteristics of a multilayer thermionic device" *Proc. Of Optoelectronic and Microelectronic Materials and Devices*, 11-13/12/2002, Ed: M. Gal, 511-514 (2003)
- A.V. Pan, S. Zhou, H.K. Liu and S.X. Dou "Overcritical state in Fe-sheathed MgB₂ superconductor wires" *Proc. 27th Ann. A&NZIP Cond. Matt. And Mat. Meet.* 4-7/2/2003, Ed: J. Cashion, T. Finlayson, D. Paganin, A. Smith and G. Troup, (2003)
- W. Xu, R.A. Lewis, P.M. Koenraad, L.R.C. Waumans and C.J.G.M. Langerak "Magnetophoton-phonon scattering in two-dimensional electron gases" *Condensed Matter Theories*, **17** 373-382, Proc. 25th Int. Workshop on Condensed Matter Theories, 3-9/12/2001, Ed: M.P. Das, F. Green (2003)
- C. Zhang "Terahertz-driven nonlinear electrical transport in semiconductor nanostructures" *Proc. Of Optoelectronic and Microelectronic Materials and Devices*, 11-13/12/2002, Ed: M. Gal, 405-408 (2003)