TEM, scanning tunneling microscopy, and high-energy and resolution x-ray diffraction were employed. The pinning sites in question included those which were introduced by controlled precipitation or artificial methods (e.g., fission-induced defects). Some of mechanisms suggested for the pinning sites for the precipitation were very fine scale 2-D modulations of composition in Bi(Pb)-2212, Nd clusters in Nd-123, and the small oxygen deficient regions in YBCO single crystals. Despite detailed microstructural characterization, presentations discussions clearly reflected an incomplete understanding of vortex pinning in these high T_c superconductors. For instance, the pinning centers in the coated Y-123 thick films and in Nd-123 single crystals are unclear. In addition, while it is known that the irreversibility line in Bi-2212 is significantly improved with lead doping, the direct mechanism, possibly planar compositional modulation or improved electronic coupling along the *c*-axis, has not been demonstrated. Thus, this subject is expected to be a topic of extensive discussions in future meetings. Another interesting theoretical presentation concerned the ever important question of current transport across grain boundaries in Y-123. Here, a model was developed for current transport across the (001) tilt boundary which took into account grain-boundary-area reduction due to edge dislocation cores, which form the boundary, as well as reduced T_c of the surrounding area via elastic strain associated with the cores. Although the model obviously simplified the structures of the boundary by using only primary dislocations to describe the boundary misorientations and by neglecting the often observed meandering boundaries or secondary dislocations, the predicted pseudo-exponential reduction of the critical current J_c with misorientation angle agreed well with the experimental self-field $J_c(0)$ results obtained for the artificially produced bi-crystal grain boundaries in YBCO thin films. In spite of the necessary simplifications of the boundary structures, this appears to represent an important step toward understanding the reduction in J_c at grain boundaries in high T_c superconductors.

Nearly a decade has passed since the advent of high-temperature superconductivity. Discovery of new materials and development of fundamental insight has occurred and continues to occur frequently. In contrast, the progress toward industrialization of the technology has been steadily accelerating. Understanding of crystal growth mechanisms for both thin film and bulk/wire crystals have been deepened, and similarities in thermodynamics, kinetics, and performances of the film and bulk HTS materials especially on processing and crystal growth were well discussed in this workshop, which will help further developments of processes for HTS commercialization. The consensus of the workshop attendees was that most larger-scale applications will require more years to realize, however, and that consistent technological advancement will require worldwide collaborations in at least precompetitive research fields and maintenance of levels of research funding and interest.

Acknowledgement

I wish to thank all session chairpersons for submission of session summaries for this report.

YUH SHIOHARA
SRL-ISTEC

UPCOMING CONFERENCE

The IV International Seminar-School in Russia to Focus on Phase Transformations and Defect Evolution in Condensed Matter

The IV International Seminar-School will present its conference, "Defect Structures Evolution in Condensed Matter," on September 2–9, 1998 in Barnaul, Russia at Altai State Technical University. This meeting will bring together an international group of scientists to discuss problems connected with crystalline, amorphous, liquid crystalline, and nanocrystalline materials with periodic and aperiodic structures. It will feature papers in the following areas:

- features of symmetry elements in condensed matter;
- definition of order parameters in condensed matter and their connection with phase transformations;
- symmetry elements and order characteristics of defects and defect structures;
- defects and defect structures and their connection with phase transformation in condensed matter;
- methods of construction of interatomic potentials: *ab initio*, semi-empirical, based on the electron density function;
- structure-energetic aspects of phase transitions in condensed matter;
- theoretical approaches to investigate real condensed matter, phase transformations regularity, kinetics and thermodynamics of transformations, changes of order parameters;
- experimental achievements related to problems of transformations in condensed matter;
- investigation of structure-energetic effects on transformations and different defect generations in condensed matter;
- achievements and problems of computer simulation of condensed matter structure-energetic transformations;
- connection of transformations with their physical properties in condensed matter; and
- the problem of integral description of defect and nondefect structures.

Abstract deadline is **November 30, 1997**. The official languages of the symposia are English and Russian. For information on abstract submittal and registration contact Orgcommittee, EDS'98 Headquarters, General Physics Department, Altai State Technical University, 46 Lenin St., Barnaul, Russia 656099; phone 7-385-2-368-522, e-mail: pva@agtu.altai.su. □

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