

# Overview of the 21st Century COE Joint International Workshop on Bulk Nitrides

June 2 and 3, 2003, Tokyo University of Agriculture and Technology (TUAT), Japan.

**Akinori KOUKITU,**  
Chair of the Workshop,

**Yoshinao KUMAGAI**  
Member of the Workshop Organizer

## 1. Scope of the Workshop

The 21st Century COE Joint International Workshop on Bulk Nitrides was held in Tokyo, Japan, on June 2nd and 3rd 2003, conveniently scheduled just after the 5th International Conference on Nitride Semiconductors (ICNS-5, Nara, May 25-30, 2003). The workshop was held as a joint meeting of 21st Century COE (Center of Excellence) programs “Future Nano-Materials” in TUAT and “Nano-Factory” in Meijo University.

The scope of the workshop was to discuss recent progress and future prospects in the fields of bulk nitrides, synthesis, epitaxial growth and characterization of GaN and AlN. The number of participants in the workshop was strictly limited (speakers of 15 invited talks and their coworkers and some university researchers), and each invited speaker offered nitride samples for display during the workshop. Speakers presented their latest results, and defined the problems and ways toward their solution. We do believe that the workshop encouraged international cooperation in the fields of bulk nitrides.



Fig. 1. Meeting place in TUAT



Fig. 2. Show time of samples



Fig. 3. Banquet at a steak house (1)



Fig. 4. Banquet at a steak house (2)

## 2. Workshop Organizers

Chair:

A. Koukitu (Tokyo Univ. of Agri. and Tech., Japan)

Vice Chair:

J. A. Freitas, Jr. (Naval Research Laboratory, USA)

Members:

H. Amano (Meijo Univ., Japan)

F. Hasegawa (Univ. of Tsukuba, Japan)

A. Usui (Furukawa Co., Ltd., Japan)

Y. Kumagai (Tokyo Univ. of Agri. and Tech., Japan)

## 3. Program

The workshop started with the welcome talk by Prof. A. Koukitu, chair of the workshop. Prof. Koukitu introduced scope of the workshop as well as the brief overview of 21st Century COE program of “Future Nano-Materials” supported by the Ministry of Education, Culture, Sports, Science and Technology of Japan.

Following is a list of the invited papers giving the speaker’s name, affiliation and paper title. 15 invited papers were categorized into the following three sessions.

### Mon. Jun. 2 “Approaches to Grow Nitrides by HVPE”

T. F. Kuech, Univ. of Wisconsin-Madison, USA

“The Initial Stages of Growth in Hydride Vapor Phase Epitaxy of GaN”

J. A. Freitas, Jr., Naval Research Laboratory, USA

“Optical Characterization of Nitrides Semiconductors”

Y. Kumagai, Tokyo Univ. of Agriculture and Technology, Japan

“Is It Possible to Grow AlN by Hydride Vapor Phase Epitaxy?”

T. Paskova, Linköping Univ., Sweden

“Growth, Separation and Properties of HVPE – GaN Films Using Different Nucleation Schemes”

A. Usui, Furukawa Co., Ltd., Japan

“Preparation of GaN Crystal by Rapid Growth Rate with HVPE”

N. Kuwano, Kyushu Univ., Japan

“Formation and Annihilation of Threading Dislocations Associated with Stress in Hetero-structure of GaN and AlGaIn”

### Mon. Jun. 2 “Fabrication of GaN Wafers by HVPE”

H-Y. Lee, Samsung Corning Co., Ltd., Korea

“Preparation of Freestanding GaN and GaN Template by Hydride Vapor Phase Epitaxy”

K. Tomita, Toyota Central R&D Laboratories, INC., Japan

“Self-separation of Freestanding GaN from Sapphire Substrates with Stripe-shaped GaN Seeds by HVPE”

V. Dmitriev, TDI, Inc., USA

“Recent Results on GaN, AlN, and AlGaIn Substrate Materials”

K. Motoki, Sumitomo Electric Industries, Ltd., Japan

“Preparation of 2-inch GaN Substrate”

R. P. Vaudo, ATMI, Inc., USA

“Characteristics of HVPE GaN Boules”

**Tue. Jun. 3 “Bulk Nitride Growth and Wafering”**

K. Evans, Crystal IS, Inc., USA

“Fabrication of Single-crystal AlN Substrates from Bulk Crystals”

Z. Sitar, North Carolina State Univ., USA

“Growth of AlN Crystals by High Temperature Sublimation”

H. Yamane, Tohoku Univ., Japan

“Crystal Growth of GaN from a Sodium Melt”

E. Meissner, Fraunhofer Inst. of Integrated Systems and Device Tech., Germany

“Growth of GaN Crystals and Epilayers from Solutions at Low or Ambient Pressure”

Finally, we thank invited speakers and all of attendees who really contributed to make this workshop successful.

