First International Workshop on Layered and Graded Materials (IWLGM-1)

May 9-12, 2004, Shenzhen, China

During May 8-13, 2004, we have successfully held the First International Workshop on Layered and Graded Materials (IWLGM-1), at Shenzhen, which is a large and modern city located in southern China. IWLGM-1 was incorporated with The Third China International Conference on High-Performance Ceramics (CICC-3), which was organized by the Chinese Ceramic Society and State Key Laboratory of New Ceramics and Fine Processing in Tsinghua University. More than 500 participants attended this conference, including about 50 participants to IWLGM-1. Our

IWLGM-1 had 21 presentations including seven invited talks from different regions. On May 11, Academician of Chinese Academy of Sciences, Prof. Chang-Chun Ge of University of Science and Technology Beijing (USTB), as the first president of Layered and Graded Materials- Association (LGM-AS), World Academy of Ceramics (WAC), declared the opening of IWLGM-1 and gave an opening address. Prof. Ge thanked all members of council of Founders of LGM-AS and participants for their supports to the establishment of LGM-AS and the opening of IWLGM-1. Prof. Ge

announced the Members of Council of Founders of LGM-AS and the congratulation letter from the Council Chairman of WAC, Dr. Pietro Vincenzini to all the participants. Prof. Ge also emphasized the importance of international collaboration about the research on layered and graded materials.

After Prof. Ge's talk, several distinguished professors (Prof. Miyamoto, Prof. Dariel, Prof. Matsuura, Prof. Jeon, Dr. Bulic) expressed their wishes to the success of LGM-AS and suggestions to further activities. Particularly, Prof. Miyamoto appreciated the organization of IWLGM-1 and emphasized the importance of the bilateral and multinational cooperation on LGM.

Following the opening address, there were seven invited talks, as shown in the program. Each invited lecture was given by Council members. The invited lectures covered new manufacturing processes, new layered and/or graded materials as well as LGM research activities and applications. The invited lectures attracted more than 60 audiences to the IWLGM-1 hall. On the morning of May 12, we had five oral presentations by young scientists from different countries. Prof. W. Pan of Tsinghua University (the organizer of FGM-2002) chaired this session. In the poster session, there were nine presentations devoted to LWG.

From 10:00 AM to 12:00 AM of 12th, Prof. Ge held the First Meeting of Council of Founders of LGM-AS to discuss several important issues about the future LGM activities. The attending council members were Prof. Ge, Prof. Miyamoto, Prof. Dariel, Prof. Jeon, Dr. Bulic (representative of Dr. Kny) and Prof. Li. Besides, Prof. J.M.F. Ferreira of Portugal, Prof. G.P. Kothiyal and Prof. M.S. Jogad of India were invited to attend the Meeting. After active discussion, all the attendants agreed the following consensuses. After the council meeting, Prof. Ge invited all the attendants to a wonderful party lunch.

Memorandum of The First Meeting of Council of Founders of LGM-AS:

1. The scope of LGM-AS: Ceramic-based layered and graded materials
2. Basically holding international workshop in incorporation with the China International Conference on High-Performance Ceramics (CICC) every two years. Occasionally holding workshop as a symposium with existing international conference in European or other regions except in China.
3. For the international collaboration with International Advisory Committee of FGM, Prof. Miyamoto suggested Prof. Ge attend FGM-2004 in Belgium, Prof. Ge gladly accepted Prof. Miyamoto's suggestion.
4. Extend company members to support the LMG-AS
5. For making website of LGM-AS. Prof. Ge finds a young researcher to do this in USTB.
6. Making a name list for circling the information exchange.

Program of IWLGM-1

Oral Presentations

- Development of solid freeform fabrication for refractory metals and alloys by 3D micro-welding, **Y. Miyamoto** (*Osaka University, Japan*)
- Some Aspects of Research on Laminated and Graded Materials in China, **C.C. Ge** (*Univ. Science and Technology Beijing, China*)
- Structural evolution of TiC/Ti microlayers, **M.P. Dariel** (*Ben-Gurion University of the Negev, Israel*)
- Carbo-nitriding coating treatment of titanium by a diffusional method, **K.**

Matsuura (*Hokkaido University, Japan*)

- Gradient structures in SiAlON´s for improved cutting performance, **F.I. Bulic** (*ARC Seibersdorf research GmbH, Austria*)
- Development of structural and functional composite materials with layered and graded (*f h & l*) structures, **J.H. Jeon** (*Korea Institute of Machinery & Materials, Korea*)
- Design, processing and evaluation of graded piezoelectric ceramic bending actuators, **J.F. Li** (*Tsinghua University, China*)
- Electrophoretic deposition of Pb(Zr,Ti)O3 powders on silicon wafer and sintering densification approach, **N. Kang** (*Tsinghua University, China*)
- Multi-layer silicon nitride laminates exhibiting high fracture toughness and crack deflection, **G. Blugan** (*EMPA, Switzerland*)
- Modified bismuth layered compounds in paraelectric phase, **R.Z. Hou** (*Zhejiang University, China*)
- Preparation of multilayer barium titanate PTC thermistor with low room temperature resistance, **H. Liu** (*Huazhong University of Science & Technology, China*)
- A study of the application of ceramics automobiles, **Y. Li** (*Tsinghua University, China*)

Poster Presentations

- Preparation and characterization of multilayered compositional graded (Ba0.80Sr0.20)(Ti1-xZrx)O3 thin films, **C. Wang** (*Institute of Physics, China*)
- Simultaneous synthesis and densification of TiC/Ti5Si3 composites via spark plasma sintering, **L.J. Wang** (*Shanghai Institute of Ceramics, China*)
- Fabrication and microstructure of Ti3SiC2 /Y-TZP functionally graded materials by spark plasma sintering, **S.L. Shi** (*Tsinghua University, China*)
- Deformation and fracture of TiN coatings on steel substrates, **Z.H. Xie** (*University of New South Wales, Australia*)
- TiB2/AlN/Cu composites fabricated by spark plasma sintering (SPS) method,

S.Z. Jin (*Tsinghua University, China*)

- Fabrication and evaluation of PZT/Ag composites and graded actuators, **H.L. Zhang** (*Tsinghua University, China*)
- Spark plasma sintering of CaSiO3/Ti graded biomaterial, **L.H. Long** (*Shanghai Institute of Ceramics, China*)
- The preparation and properties of new metal oxide-silver graded composite electrical contact materials, **F. Zhang** (*Huazhong University of Science &. Technology, China*)
- Kantorovich method of heat-resistant heterogeneous graded ceramics structure on automobiles, **Y. Li** (*Tsinghua University, China*)

The Proceedings of the First International Workshop of Layered and Graded Materials will be published as a part of the Proceedings of the Third China International Conference on High-Performance Ceramics by TRANS TECH PUBLICATIONS, all the papers included in the Proceedings will be covered by Science Citation Index (SCI).