

Resume

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- Curriculum



Han-Yang University	B.S.	03. 1990 – 02. 1994
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Universität Stuttgart (독일)	Ph. D. (Chemistry)	07. 2000 – 06. 2004
Max-Planck Institut für Metallforschung (독일)	Post-Doc.	07. 2004 – 06. 2005
National Institute for Materials Science (일본)	Post-Doc	07. 2005 – 07. 2008
Korea Institute for Materials Science	Senior researcher	08. 2008 – 03. 2013
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Ph. D. Thesis: Processing of carbon fiber reinforced composites with particulate-filled precursor-derived Si-C-N matrix phases

Recent research achievement

1. Development of processing for the synthesis of highly pure and ultra-fine ultra-high temperature ceramic (UHTC) powders with controlled multiple-chemical composition, shape and size distribution.
 - Synthesis of $Ta_xHf_yC_z$ powder with completely spherical shape, ultra-high purity (>99.9%, metal basis purity except Zr) and ultra-fine size (d_{50} : 50nm) at extremely low temperature (1450°C).
2. Fabrication of excellent ablation resistant UHTC composites for arc-jet plasma wind tunnel test and rocket nozzle test.
 - Fabrication of excellent ablation resistant nano-UHTC composites using arc-jet plasma wind tunnel at 2500°C under Mach 2 (heat flux: 6MW/m²)
 - Fabrication of excellent ablation resistant nano UHTC-composite using a rocket nozzle during 5 times of repeated ablation tests for 15 seconds each.
3. Development of dispersion technology for the preparation of ultra-fine and highly concentrated UHTC and SiC slurries.
 - Preparation of aqueous HfB_2 , ZrC, HfC and ZrB_2 slurries with max. 64 vol% using ultra-fine powders (D_{50} : 300nm) and 70 vol% of aqueous SiC slurry using binary ultra-fine powders (D_{50} : 170nm - 10 μ m)
4. Fabrication of liquid ZrC precursor with low price, low viscosity, high purity, thermal curability and high ceramic yield (72%).
5. Fabrication of SiC-SiC composites with high hardness (19GPa) and excellent thermal stability up to 2000°C by PIP process using ultra-fast processing technology (total PIP time : 3 days)

SCI(E) publication (*: corresponding autor)

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6. **S. H. Lee**, M. Weinmann, F. Aldinger, Particulate-reinforced precursor-derived Si-C-N ceramics: optimization of pyrolysis atmosphere and schedules, *J. Am. Ceram. Soc.*, **88** [11], 3024–3031 (2005).
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9. **S. H. Lee**, Y. Sakka, Y. Kagawa, Dispersion behavior of ZrB_2 powder in aqueous solution, *J. Am. Ceram. Soc.*, **90** [11], 3455–3459 (2007).

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12. **S. H. Lee**, M. Weinmann, P. Gerstel, F. Aldinger, Extraordinary Thermal Stability of SiC Particulate-reinforced Polymer-derived Si-B-C-N Composites, *Scripta Mater.*, **59** [6], 607–610 (2008).
13. **S. H. Lee**, G. Kaiser, G. Rixecker, F. Aldinger, J. Y. Park, K. H. Auh, S. C. Choi, Hydrothermal treatment of Si₃N₄ for the improvement of oxidation resistance at 1400 °C, *J. Am. Ceram. Soc.*, **91** [2], 679–682 (2008).
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15. **S. H. Lee**, M. Weinmann, F. Aldinger, Processing and properties of C/Si-B-C-N fiber-reinforced ceramic matrix composites prepared by precursor impregnation and pyrolysis, *Acta Mater.*, **56** [7], 1529–1538 (2008).
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