

Materials for Thermal Management

Keywords : Thermal barrier coatings, Thermal insulation materials, Aerogel

研究の背景

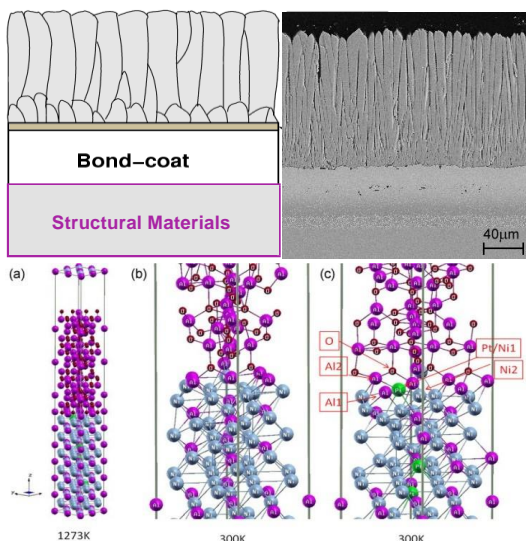
Increasing interest and attention are now being placed on new thermal-managing technologies. My research concerns with the design, synthesis and characterisation of thermal barrier coatings for aero engines and high performance thermal insulation materials for thermal management applications.

研究の狙い

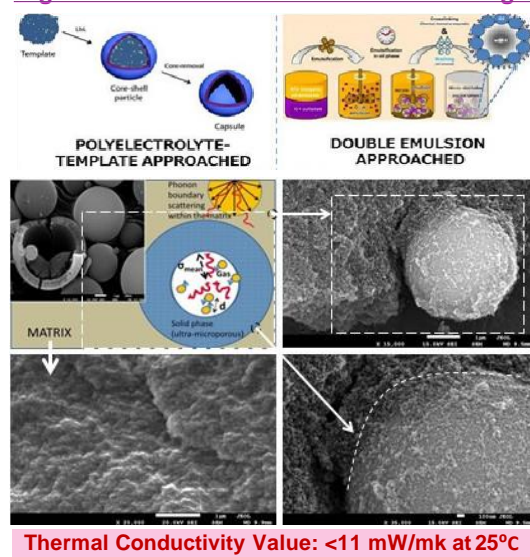
The aim of my research is focused on understanding the relationship between materials thermophysical properties and microstructures. Approaches involve the enhancement of phonon scattering by optimizing intrinsic nano porosity and engineering extrinsic hollow cavities.

最先端研究トピックス

Low Cost Bond Coats for TBCs Applications



High Performance Thermal Insulation Aerogel



文献

- MRS Advances, (2017) 1-6 DOI:10.1557/adv.2016.333
- Materials Letters, 126 (2014) 92-96 DOI:10.1016/j.matlet.2014.03.114
- Book: Thermal Barrier Coatings, Woodhead Publishing Ltd., Cambridge, UK (2011)

応用分野と今後の展開

- Ultra-high performance thermal insulation technology
- Thermal insulation materials for buildings
- Thermal insulation coatings for mission critical applications
- Low cost and PGMs-free thermal barrier coatings

実用化に向けた課題

- Size and geometric effects of hollow particles on the thermal conductivity of hybrid aerogels need to be optimized
- Process simplification and cost reduction associated with the fabrication of hybrid aerogel



ナノパワー分野 熱エネルギー変換材料グループ

Rudder Wu

E-mail: WU.Rudder@nims.go.jp

URL: http://samurai.nims.go.jp/WU_Rudder-j.html