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主要研究領域

研究的領域在於探討無機材料的相平衡、相變化、與熱力學性質。目前研究的材料主要為電子軟鐳材料、太陽能材料、與如 CoSb_3 、 PbTe 、與 Bi_2Te_3 等熱電材料。主要的研究工作為以實驗量測與Calphad模型計算的方法、決定相關材料系統的相平衡圖，探討異質材料間之界面反應現象，以及相平衡對製程選擇之影響。

Main Research Interests

Our research interests focus on determinations of phase equilibria, phase transformation and thermodynamics of inorganic materials. The materials under investigations are electronic soldering materials, photovoltaic materials and thermoelectric materials. Phase diagrams of related material systems are determined both by experimental measurements and calculations using the Calphad method. Phase transformation during processes and interfacial reactions at the joints are examined, and the reaction mechanisms are explored. The knowledge can then be used for the determinations of manufacturing processes.

代表作 (Selected Publications)

- Y. Tang, R. Hanus, **S.-W. Chen***, G. J. Snyder, "Solubility Design Leading to High zT in Low-Cost Ce-CoSb₃ Skutterudites", Nature Communications, Vol. 6, Article number: 7584 doi:10.1038/ncomms8584, 2015.
- **S.-W. Chen***, C.-Y. Wu, H.-J. Wu, and W.-T. Chiu, "Interfacial reactions in Sn/Bi₂Te₃, Sn/Bi₂Se₃ and Sn/Bi₂(Te_{1-x}Sex)₃ couples", Journal of Alloys and Compounds, Vol. 611, pp. 313-318, 2014.
- C.-H. Liu, H.-J. Wu, and **S.-W. Chen***, "Liquidus projection of the ternary Bi-Sb-Te thermoelectric material system", Metallurgical and Materials Transactions A, Vol. 44A, pp. 5424-5433, 2013.
- **S.-W. Chen***, J.-S. Chang, K. Pan, C.-M. Hsu and C.-W. Hsu, "Directional solidification and liquidus projection of Sn-Co-Cu system", Metallurgical and Materials Transactions A, Vol. 44A, pp. 1656-1664, 2013.
- **S.-W. Chen***, H.-J. Wu, C.-Y. Wu, C.-F. Chang and C.-Y. Chen, "Reaction evolution and alternating layer formation in Sn/(Bi_{0.25}Sb_{0.75})₂Te₃ and Sn/Sb₂Te₃ couples", Journal of Alloys and Compounds, Vol. 553, pp. 106-112, 2013.
- C.-Y. Chen, H.-J. Wu, and **S.-W. Chen***, "Liquidus projection and phase equilibria isothermal section of Se-Sn-Te system", Journal of Alloys and Compounds, Vol. 547, pp. 100-106, 2013.
- H.-J. Wu, **S.-W. Chen***, T. Ikeda, G. J. Snyder*, "Reduced thermal conductivity in Pb-alloyed AgSbTe₂ thermoelectric materials", Acta Materialia, Vol. 60, pp. 6144-6151, 2012.
- Y.-K. Chen, C.-M. Hsu, **S.-W. Chen***, C.-M. Chen and Y.-C. Huang, "Phase equilibria of Sn-Co-Cu ternary system", Metallurgical and Materials Transactions A, Vol. 43(10), pp. 3586-3595, 2012.

