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Research Interests

1. Process development for synthesis of high thermal conductivity AlN powder
2. Sintering of AlN substrates for high power electronic and opto-electronic applications
3. Process development for low temperature cofiring AlN/ceramic composites for microelectronic applications
4. Process development for high thermal conductivity AlN/polymer composites
5. Synthesis of high-performance phosphor materials for LED solid state lighting
6. Synthesis of high performance ceramic catalyst support for low temperature and clean combustion of hydrocarbons
7. Development of materials and technology for hot-repairing of steel-making furnaces

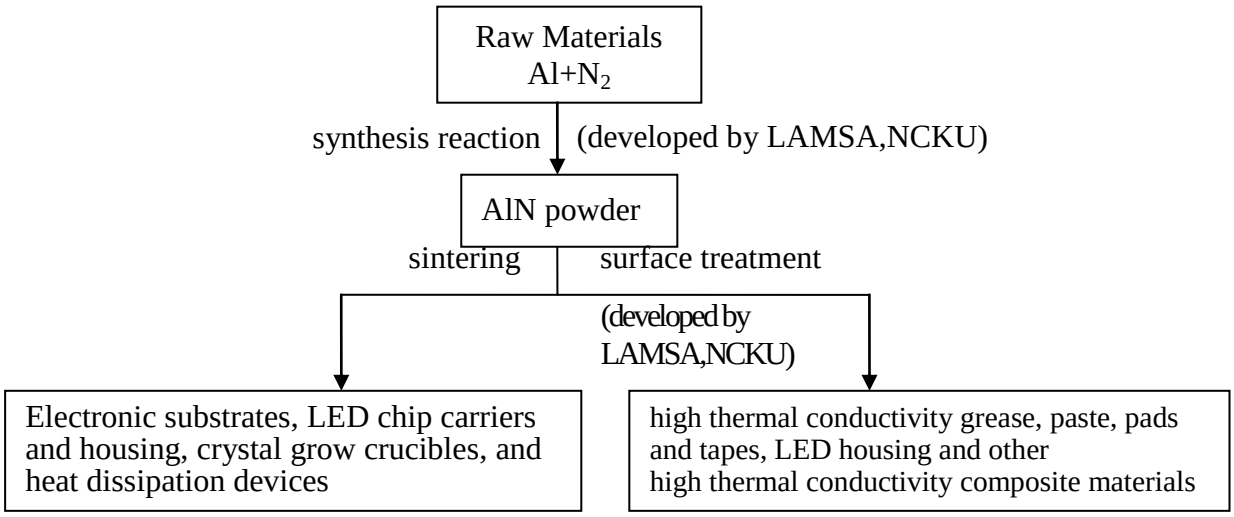
Representative Publications

1. Shyan-Lung Chung*, Shu-Chi Huang, Wei-Chi Chou and Wira Wibisono tangguh,.Phosphors based on nitridosilicates:synthesis methods and luminescent properties. *Current Opinion in Chemical Engineering*,3:1-6.(2013).
2. Shyan-Lung Chung* and Wei-Chi Chou. Combustion Synthesis of Ca2Si5N8:Eu2+ Phosphors and their Luminescent Properties. *Journal of the American Ceramic Society*,96(7):2086-2092(2013).
3. Shyan-Lung Chung* and Chun-Hung Lai, ”Combustion Synthesis of Aluminum Nitride : A Review”, in *Innovation in Materials Science II, Periodical of Key Engineering Materials* Vol. 521, pp.101-111 edited by M. Nadagouda, M. Connelly, B. Derin, H. P. Li, and J. A. Sekhar, Trans Tech Publications, 2012.
4. Shyan-Lung Chung* and Ching-Mei Wang. Solution Combustion Synthesis of TiO2 and its Use for Fabrication of Photoelectrode for Dye Sensitized Solar Cell. *Journal of Materials Science and Technology*, 28(8): 713-722.(2012).
5. Shyan-Lung Chung*,T. I. Tsai and S. C. Huang, High Thermal Conductivity Ceramics from Combustion Synthesized AlN Powder through Microwave Sintering and Reheating. *International Journal of Self- Propagating High Temperature Synthesis*, 21(1): 45-50.(2012).
6. Shyan-Lung Chung* and Chih-Wei Chang, Carbothermal Reduction and Nitridation Synthesis of Silicon Nitride by Using Solution Combustion Synthesized Precursors. *Journal of Materials Science*, 44:3784-3792.(2011).
7. Shyan-Lung Chung* and Ching-Mei Wang, A Sol-Gel Combustion Synthesis Method for TiO2 powders with Enhanced photocatalytic Activity. *Journal of Sol-Gel Science and Technology*, 57:76-85.(2011).

Patents Granted

1. Shyan-Lung Chung*, Chun-Nan Lin, Chih-Wei Chang, Jing-Hsin Lin and Hung-Ing Lin, ”Manufacturing Method for AlN ”, ROC patent No.I401206(7/11/2013), Japan and China patents in pending.
2. Shyan-Lung Chung*, Hui-Yi Wang and Yen-Chun Liu,”Synthesis Methods for Nitride Phosphors” ROC Patent No.I391471(4/1/2013); USA, Japan and China Patents in pending.

A. Synthesis of aluminum nitride (AlN) and its applications



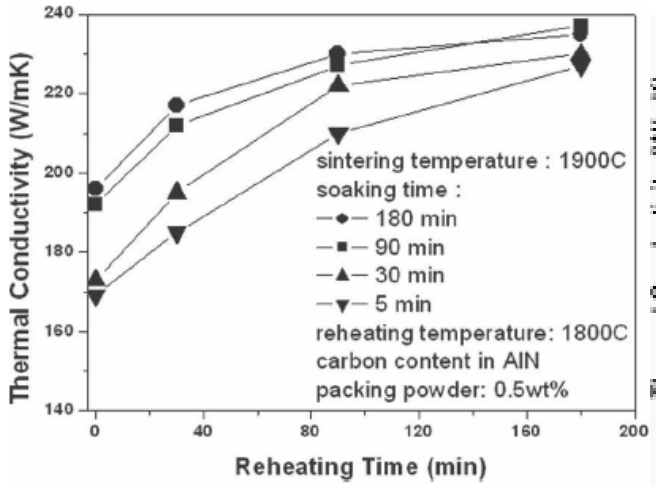


FIG. 8. Effect of the reheating time on the thermal conductivity of the sintered AlN specimen reheated at 1800 °C with a carbon addition of 0.5 wt%.

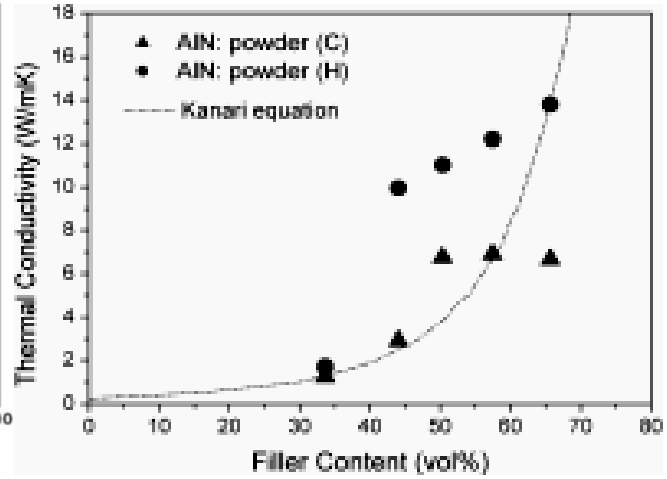
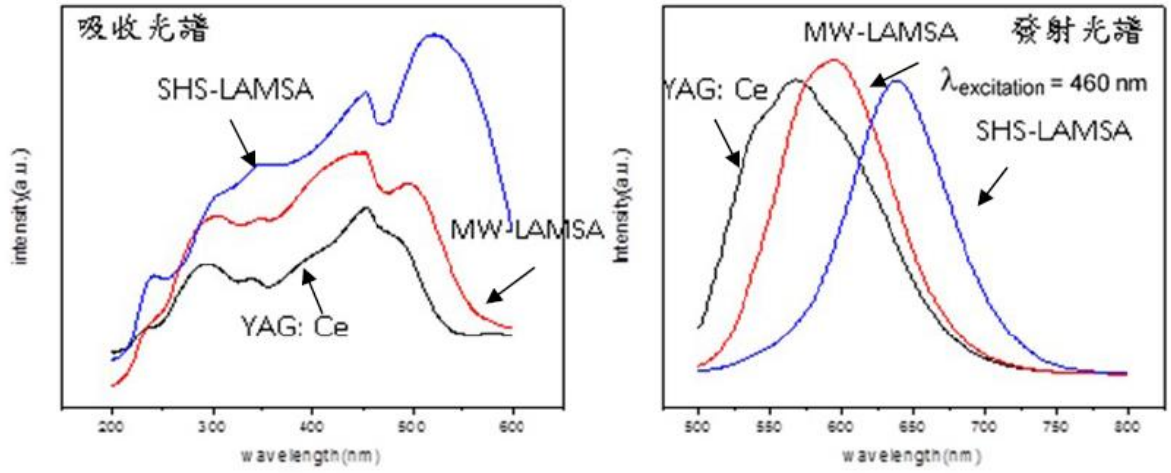


Figure 8. Effect of filler content on thermal conductivity of the EMC specimens filled with either powder C or H of the AlN.

B. Synthesis of high-performance phosphor materials for LED solid state lighting



The photoluminescence properties of $CaAlSiN_3:Eu^{2+}$ phosphor synthesized by combustion synthesis (SHS-LAMSA) and microwave synthesis (MW-LAMSA) methods developed by LAMSA, NCKU.