D03-02-3
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R & D Status of Powder Metallurgy at the Center of Advanced Materials Processing(CAMP) in Korea

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Abstract

The 21st Century Frontier Program, which is one of the R&D programs funded by Korean government, was launched in 1999 to elevate the status of Korean science and engineering capabilities to the advanced nation in the strategic fields. Currently, 23 different fields of science and engineering programs are carried out by researchers in institutes, universities and industries. Center for Advanced Materials Processing (CAMP) was formulated in 2001 to develop the advanced materials as well as to improve the parts manufacturing process. The main role of CAMP is proposing and forecasting the long term vision in Materials Processing Technology and also supporting the project teams for their best performance in R&D. The CAMP program consists of 5 research areas such as, Multi-layer Ceramic Electronic Parts, Powder Formed Precision Parts, 3 Dimensional Polymer Based Composites, Functional Metal Sheets, Parts Integration Technology. An introduction of R & D activities at CAMP, specially focusing on powder metallurgy, will be presented.

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Aerosol Deposition Process for Ceramic Thick Film Formation

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Abstract

Fabrication of ceramic thick films on Cu or other metal substrates is a key issue to realize the integration and the embedding of passive components in print wiring boards (PWB). The aerosol deposition process (AD process) developed in AIST, Japan is the only technique to fabricate ceramic thick films at room temperature. Barium titanate films were successfully deposited on Cu substrate at room temperature for embedded capacitors. The perfectly dense and crystalline films could be obtained. However, dielectric permittivity of the film was less than 100 because particles of barium titanate were broken into small peaces in the deposition process. A heat treatment at 300 C improved the permittivity up to 200, giving rise to the capacitance density above 1 nF per square millimeter. Transparent alumina films could be deposited on metal substrates and micro-stripline filters were fabricated on them. Dielectric films for microwave applications were also formed on Cu substrate. It was found that the selection and treatment of raw powders were extremely important to obtain films with high performance.