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Fabrication Methods of Porous Ceramics and Their Applications in Advanced Engineering - Large Flat Precision Plate for Flat Display Industries

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Normal sintering process of producing porous ceramics is not to sinter perfectly, i.e., stop sintering in middle-process. Our porous ceramic materials are a product of complete sintering. For example if one want to make a porous carborundum, raw carborundum powder is sintered at either lower temperatures than normal sintering temperature or shorter sintering periods than normal sintering time to obtain incompletely sintered materials, i.e., porous carborundum. This implies normally sintered porous ceramic materials can mot be used in high vacuum conditions due to dust coming out from uncompleted sintering. We could produce completely sintered porous ceramic materials. For example, we can produce porous carborundum material by using carborundum particles bonded by glassy material. The properties of this material are similar to carborundum. We could make quasi-zero thermal expansion porous material by using carborundum and particles of negative thermal expansion materials bonded by the glassy material. We apply to sinter them also by microwave to sinter quickly. We also use HIP process to introduce closed pores.

We could sinter them in large size to produce 2.5 m × 2.5 m ceramic plate to use as a precision plate for flat display industries. This flat ceramic plate is the world largest artificial ceramic plate. Precision plates are basic importance to any advanced electronic industries. The produced precision plate has lower density, lower thermal expansivity, higher or similar damping properties added extra properties such as vacuum vise, air sliding capacity. These plates are highly recommended to use in flat display industries. We could produce also cylindrical porous ceramics materials, which can applied to precision roller for polymer film precision motion for also electronic industries.

Keywords: porous ceramics, grinding

PT-2

Scalable and Viable Paths to Printed (or Flexible) Electronics

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Development of printed electronics, which is occasionally referred to as ‘flexible’ or ‘polymer’ electronics, has attracted considerable world wide attention in recent years. Printed (or flexible) electronics is currently expected to represent a new form of electronics and open up wide ranging applications in displays, electron devices for medical use, sensors, and other areas. This presentation aims to provide a strategy for scalable and viable paths to accomplish flexible, printable, large area circuits displaying high performance. Novel approaches evolving from system on package (SoP) to system on flex (SoF) technology will allow the integration of heterogeneous materials platforms into a system which is needed to enhance the functionality of the system. The talk also includes speculations about areas on which future advances in printed electronics could have a substantial impact along with a brief introduction of the Korea Printed Electronics Association (KoPEA).

Keywords: Printed electronics, flexible electronics, system on package, system on flex