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## Ag Coated SiC/YBCO Composite Prepared by the Plasma Activated Sintering Method

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YBCO/Ag coated SiC composites containing 0.5, 1.0 and 3.0 wt% whisker were prepared by the conventional plasma activated sintering method (PAS) at 973-1,103 K. SiC whisker was covered with Ag thin film by electroless coating method to suppress interfacial reaction between superconductor and SiC whisker. It was shown that superconducting transition occured at 90K in the specimen with 3 wt% of Ag coated SiC whisker.

Many attempts had been done to reinforce the high-Tc superconductor. YBCO/Ag<sup>1,2</sup> and YBCO/Sn<sup>3</sup> composites had been prepared to obtain the ductile composite cermet. MgO whisker was also used to reinforce bulk BPSCO. <sup>4</sup> In this study Ag thin layer was deposited on SiC whisker surface by the electroless coating method to prevent the interfacial reaction between SiC and YBCO. YBCO was prepared by the conventional solid state reaction. YBCO was mixed with appropriate amounts of Ag coated SiC whisker to obtain YBCO/Ag coated SiC composites containing 0.5, 1.0 and 3.0 wt% whisker. Plasma activated sintering (PAS) of YBCO/Ag

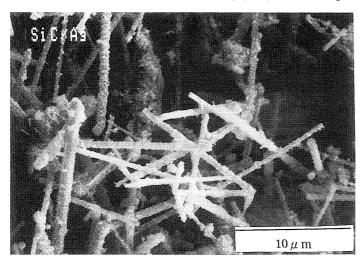


Figure 1. Morphology of SiC whisker coated with silver.

coated SiC whisker composites was carried out at 873 to 1098K and 1500kgf for a short holding period of 900 sec in the air.

SiC coated whiskers were inspected with a scanning electron microscope (SEM) to determine coating morphology. Typical SEM images from the Ag coated SiC whisker are shown in Figure 1.

The sample sintered by PAS was post-anneled at 773 K for 4 h in the air. For Tc measurement, AC susceptibility was measured by computer-controlled AC inductance bridge in the temperature range from 30 to 300 K. The critical temparature of the sintered bulk sample was 90 K. This value is almost the same as Tc of pure YBCO. It was reported that the electrical characteristics of the high-Tc superconductor show a shift of Tc toward lower temperature with increase in insulating material such as SiC and  $Al_2O_3$ . From these results we assumed that Ag thin film on SiC whisker may suppress interfacial reaction between YBCO and SiC whisker.

The Vickers hardness number(KHV) of the Ag coated SiC whisker/YBCO composite was 3.2-3.5 GPa (330-362kgf/mm<sup>2</sup>).

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