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复合电铸制备Cu/SiC<sub>p</sub>复合材料

朱建华, 刘磊, 胡国华, 沈彬, 胡文彬, 丁文江

(上海交通大学 金属基复合材料国家重点实验室, 上海 200030)

**摘要:** 采用复合电铸工艺制备碳化硅颗粒(SiC<sub>p</sub>)增强铜基复合材料, 研究了镀液中颗粒浓度、镀液温度、电流密度对v复合材料中SiC<sub>p</sub>含量的影响。通过优化各工艺参数可有效促进SiC<sub>p</sub>与铜的共沉积, 提高复合材料中增强固体颗粒的含量。结果表明: 随着SiC<sub>p</sub>含量增加, Cu/SiC<sub>p</sub>复合材料的热膨胀系数和导热系数减小, 抗弯强度和硬度提高。此外, 复合电铸工艺制备的复合材料具有较大内应力, 对Cu/SiC<sub>p</sub>复合材料的热膨胀性能和硬度有一定影响。

**关键字:** 复合电铸; 碳化硅颗粒; 铜基复合材料

Composite electroforming of Cu/SiC<sub>p</sub> composites

ZHU Jian-hua, LIU Lei, HU Guo-hua, SHEN Bin, HU Wen-bin,  
DING Wen-jiang

(State Key Laboratory of Metal Matrix Composites,  
Shanghai Jiaotong University, Shanghai 200030, China)

**Abstract:** The SiC<sub>p</sub> reinforced copper-based composites was prepared by using composite electroforming technology. The influences of the concentration of SiC<sub>p</sub> in plating solution, the temperature of plating solution, and current density on the SiC<sub>p</sub> content in Cu/SiC<sub>p</sub> composites were studied. The results show that through optimizing the technology parameters, it could promote co-deposition of Cu and SiC<sub>p</sub> effectively and increase SiC<sub>p</sub> volume content in composites. The results indicate that with increasing SiC<sub>p</sub> content, CTE (coefficient of thermal expansion) and conductivity factor decrease, but strength and HV(Vickers-hardness) increase. Besides, internal stress exist in Cu/SiC<sub>p</sub> composites fabricated by composite electroforming, which has influences on HV and thermal expansion property of Cu/SiC<sub>p</sub> composites.

**Key words:** composite electroforming; SiC<sub>p</sub>; copper-based composites

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地址: 湖南省长沙市岳麓山中南大学内 邮编: 410083

电话: 0731-8876765, 8877197, 8830410 传真: 0731-8877197

电子邮箱: f-ysxb@mail.csu.edu.cn