

论文摘要

中国有色金属学报

ZHONGGUO YOUSEJINSHUXUEBAO XUEBAO

第17卷 第4期 (总第97期) 2007年4月

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文章编号: 1004-0609(2007)04-0612-05

MoS₂在空间对接摩擦材料烧结过程中的行为变化

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摘要: 采用粉末冶金技术制备了空间对接用铜基摩擦材料, 利用X射线衍射及定量化学分析技术对MoS₂在材料烧结过程中的变化行为及与其他组元之间的作用进行研究。结果表明, MoS₂在加压烧结过程中存在三个方面的反应: 在高温下分解成Mo和S, 并造成了S元素的损失; 与Cu作用形成了复杂的铜钼硫化物; 与Cu反应生成了Cu的硫化物, 该类化合物具有与MoS₂相类似的层状结构, 有一定的润滑作用。MoS₂高温分解后或MoS₂与Cu反应产生的Mo元素与石墨反应形成了Mo的碳化物。另外, 双飞粉的加入不仅与材料中的Mo元素作用形成CaMoO₄, 并且改变了铜钼硫化物、Cu的硫化物以及Mo的碳化物中各元素的摩尔比。

关键字: MoS₂; 加压烧结; 摩擦材料; 铜基; 空间对接

Transformation of MoS₂ during sintering process of space docking friction material

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Abstract: Cu-based friction material was prepared by powder metallurgy (P/M) technique. The transformation of lubricant MoS₂ and its action with other component in material during sintering were studied by X-ray diffraction and quantitative chemistry analysis. The results show that there are three reactions of MoS₂ in sintering process as follows: a part of MoS₂ decomposes into Mo and S at higher temperature, results the loss of S element; another part of MoS₂ responds with Cu into an intricate compound made of Cu, Mo and S elements; the surplus part of MoS₂ reacts with Cu into copper sulfide during sintering. Mo element reacts with graphite into molybdenum carbide. The heavy calcium carbonate powder added could react with Mo element into CaMoO₄, and change the mole ratio of Cu-Mo-S intricate compound, copper sulfide and

molybdenum carbide.

Key words: MoS₂; pressure sintering; friction material; Cu-based; space docking

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