



Nd-Fe-B-Sn合金的显微组织及其对磁性能的影响

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Microstructure of Ne-Fe-B-Sn and its effect on magnetic properties

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全文: PDF (298 KB) HTML (KB) 输出: BibTeX | EndNote (RIS) 背景资料

摘要 用粉末冶金烧结法制备了Nd-Fe-B,Nd-Fe-B-Sn和Nd-Dy-Fe-B-Sn永磁合金,用SEM和TEM分析了合金的显微形貌及相结构,并用永磁参量测量仪和振动样品磁强计(VSM)测量了合金的磁性能.研究表明,添加在合金中的Sn元素主要分布在富钕相中,且改善了富钕相与基体相(Nd₂Fe₁₄B)的润湿性.合金的相组成仍然是Nd₂Fe₁₄B相(Φ 相)、富钕相、富硼相(η 相),添加锡没有导致合金中析出新相.但是,添加锡使Nd-Fe-B系合金的室温磁性受到损害,然而却使合金在较高温时的矫顽力温度系数和开路磁通不可逆损失明显减小.锡元素对合金显微组织的改善,可能是合金高温磁性能改善的根本原因.

关键词: 钕铁硼 添加剂 显微组织 磁性能

Abstract: Sintered Nd-Fe-B, Nd-Fe-B-Sn and Nd-Dy-Fe-B-Sn permanent materials were prepared through powder metallurgy technology. Their microstructure have been investigated with SEM, EPMA and TEM. In addition, their magnetic properties were characterized by means of magnetometer and VSM at room and elevated temperature. It is showed that, in microstructure, phases of alloy added tin remains Φ , Nd-rich and η . None of other phase has been found, but tin atom solves in Nd-rich phase. This results in the improvement of wettability between Φ grains and Nd-rich. The magnetic properties of Nd-Fe-B are degraded at room temperature because of adding tin. However, the thermostability of magnetic properties is increased at elevated temperature, L_{irr} and βH_C reduced remarkably, when tin has been introduced into alloy's constituent. So, the improvement of magnetic properties should correlate with the change of microstructure benefited from adding tin.

Key words: Nd-Fe-B permanent magnet additive microstructure magnetic property

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