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论文

磁记录Fe,Co,Ni纳米晶体的熔化温度

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摘要： 本文提出了一个无自由参数的晶体熔化温度随尺寸变化的模型．模型指出纳米金属晶体的熔化温度随着纳米晶的尺寸的减小而降低．当纳米尺寸达到其最小值时，熔化温度达到最低并伴随着熔化熵的消失．该模型对In，Pb纳米粒子和铁薄膜的熔化温度的理论预测与实验结果一致．在此基础上，预测了Fe，Co和Ni等纳米粒子磁记录材料的熔化温度

关键词： 磁记录纳米粒子 粒子半径 熔化熵 熔化温度

MELTING TEMPERATURES OF Fe, Co AND Ni MAGNETIC RECORDING NANOCRYSTALS

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Abstract: A model without any adjustable parameters, describing the dependence of melting temperature on grain size, was established. It is demonstrated that melting temperature of metallic nanocrystals decreases as its size decreases. When the size of nanocrystals reaches its minimum, the melting temperature of the nanocrystals reaches its lowest value and the corresponding melting entropy is zero. With this model, the calculated melting temperatures of in and Pb nanocrystals and Fe thin film are in correspondence with the experimental results. The melting temperatures of magnetic recording nanocrystals of Fe, Co and Ni elements are predicted.

Keywords: magnetic recording nanocrystal radius of nanocrystal melting entropy melting temperature

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