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简报

化学气相反应合成MoS_2纳米管的研究

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摘要　以MoO_3粉和S为原料,高温下在普通管式炉中化学气相反应制备合成了MoS_2纳米管。结果显示制备合成的MoS_2纳米管全是开口的，直径分布很均匀，有的纳米管上粘结有纳米粒子。研究了实验温度、气流速度（反应气氛）对实验结果的影响，结果显示反应温度在810～905℃范围内才能生成MoS_2纳米管；气流速度（反应气氛）如果不合适将生成MoO_2或$MoO_{2-x}S_x$。在实验结果的基础上提出了逐步反应模型和一种新的MoS_2纳米管形成机理。

关键词　二硫化钼　无机富勒烯　纳米管　形成机理

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Formation of MoS_2 nanotubes by chemical vapour deposition

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Abstract MoS_2 nanotubes are obtained by the chemical vapour deposition reaction from MoO_3 powder and S in a conventional tube furnace at elevated temperature. It is shown that all of MoS_2 nanotubes are openended with uniform diameters. Some nanotubes remain attached to nanoparticles. The influences of reaction temperature , argon flow rate (reaction atmosphere) on products are studied. It is shown that nanotubes are prepared only at 810-905℃ with an appropriate argon flow rate. MoO_2 or $MoO_{2-x}S_x$ is produced while argon flow rate are inaccurate. A stepwise reaction model and a newly growth mechanism of MoS_2 nanotubes are proposed based on the experimental results.

Key words molybdenum disulfide　inorganic fullerene　nanotubes　growth mechanism

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