无机化学学报
CHINESE JOURNAL OF INORGANIC CHEMISTRY



# 高压条件下合成硅纳米线

# Preparation of Silicon Nanowires under High Pressure



中文关键词：硅纳米线；　氧化物辅助生长；　高压裂解

英文关键词：silicon nanowire; oxide-assisted growth mechanism; decomposition under high pressure

基金项目：

| 作者 | 单位 |
| --- | --- |
| 陈扬文 | 复旦大学材料学系，上海 200433 |
| 江素华 | 复旦大学材料学系，上海 200433 |
| 邵丙铣 | 复旦大学材料学系，上海 200433 |
| 汪荣昌 | 复旦大学材料学系，上海 200433 |

中文摘要：

英文摘要：

Silicon nanowires (SiNWs) were synthesized with silicon monoxide as the only starting material. At the beginning, a protective gas argon was charged into the reaction chamber and the temperature ramp was controlled at 3 ℃ · $min^{-1}$. The growth condition for SiNWs was controlled at 480 ℃ under the pressure of 2.8 MPa. The morphology and the structure of the products were characterized by TEM, HRTEM and XRD. The results revealed that SiNWs were diamond structure and their diameters were distributed from 5 to 25 nm. The SiNW was single crystal in the central core and was coated with amorphous silica shell at the exterior surface. Influenced by the quantum effect, Raman spectrum of the SiNWs was found to be redshifted. The oxide-assisted growth mechanism was suggested to explain the growth model of self-assembled SiNWs.



主办单位：中国化学会　　单位地址：南京大学化学楼

服务热线：(025)83592307　　传真：(025)83592307　　邮编：210093　　Email：wjhx@netra.nju.edu.cn

本系统由北京勤云科技发展有限公司设计