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论文

LPCVD掺氧多晶硅电学特性研究

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摘要
本文通过测量电导率特性对LPCVD掺氧多晶硅(SIPOS)的电学特性进行了研究。结果表明,SIPOS的电学特性与其含氧量和退火温度有关。SIPOS的含氧量增加,其电导率下降;在退火过程中,随退火温度的不同,SIPOS的电导率的变化存在两个不同过程:低温退火过程中,电导率的变化与SIPOS中的Si-O键的分布和作用有关;而在高温退火过程中,电导率的变化则是SIPOS薄膜再结晶的结果。本文对SIPOS的掺杂效应也进行了研究。结果表明,SIPOS掺杂后电导率明显提高;而含氧量对掺杂后的SIPOS的电导率的提高具有明显的抑制作用。

关键词 掺氧多晶硅 低压化学汽相淀积 含氧量 掺杂

分类号

ELECTRICAL PROPERTIES OF LPCVD POLYSILICON DOPED WITH OXYGEN ATOMS

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Abstract
The electrical conductivity of LPCVD SIPOS films has been measured to study the electrical properties cf SIPOS. The results show that the electrical properties of SIPOS depend on both oxygen contents and anealing processes. The electrical conductivity dccreases while the oxygen content in SIPOS increases. The temperature dependence nf the electrical conductivity of SIPOS during anealing shows that there are two kinds of conduction mechanisms, that is, conductivities of SIPOS are concerned in the reaction of Si-O bonds andthe recrystallization of SIPOS during low temperature(<500℃) and high temperature(>900℃) anealing, respectively. In addition, the doping effect on the conductivity of SIPOS has been studied. It has been observed that doping made the increase of conductivity in SIPOS, but the oxygen contents apparently suppressed the increase of conductivity in doped-SIPOS.

Key words LPCVD-SIPOS: Electrical conductivity Oxygen content Doping

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