金屬誘發成長低溫多晶矽之特性研究

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摘 要

本論文係研究以金屬-鎳(Ni)來誘發含氫之非晶矽薄膜，此進行之方式是採取成核與成長同時進行來形成多晶矽之技術。此技術是利用快速升溫化學氣相沉積系統成長矽薄膜與鎳直接進行反應，並針對不同厚度比例之鎳來探討結晶性。再者也研究如何改善金屬污染以及提升多晶矽薄膜特性。 從目前研究發現，成長矽溫度550℃以及氫含量控制在30sccm、金屬厚度為20nm時，所獲得結晶性最好。此外，考量到金屬汙染的因素，除了減低金屬厚度至5nm之外，還選用特定比例溶液5HNO3：1HCl以及蝕刻時間約三分鐘，來減低金屬殘留於矽薄膜中之含量達到2.6%。最後吾人利用約數小時退火可以發現，單一晶粒的大小可達到數百nm，並且片電阻可低至100Ω/sq.以下。

關鍵詞 : 多晶矽 ; 快速升溫化學氣相沉積 ; 金屬污染

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