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论文

单晶硅表面金字塔生长过程的实验研究

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摘要:

在普通碱液中添加一种特殊的添加剂,在不同时间下对单晶硅表面进行刻蚀.用扫描电子显微镜观察样品表面形貌,结果显示:单晶硅片放入加入添加剂2 mL的刻蚀液中,经过10 min刻蚀后晶体表面零星出现大小不一的金字塔,并有大面积的平滑区|刻蚀15 min后金字塔大小趋向一致,平滑区面积缩小|刻蚀20 min硅片表面形成平均尺寸为2~4 μm金字塔绒面结构,并且均匀性好、覆盖率高|刻蚀25 min后,进入过腐蚀阶段,金字塔出现变大的现象.研究表明:与传统碱腐蚀相比,添加剂可以缩短单晶硅刻蚀时间,并获得较为理想的绒面结构,在工业上应用可以降低生产成本和生产时间,提高生产率.

关键词: 单晶硅 微结构 绒面

,Formation Process of Pyramids on Single Crystal Si Surface

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Abstract:

The texturing process with alkaline solution added a new additive on single-crystal silicon surface was discussed.At different times,alkaline solution added a new additive was used to etch the Si wafers,and samples were scanned by scanning electron microscopy.The results show that there are a few different size pyramids and smooth regions in large-area on the Si surface after etching 10 min|after etching 15 min,the sizes of pyramids become uniform,and the areas of smooth regions will reduce|after etching 20 min,the etched surface is covered with the 2~4 μm of pyramids,and the distribution is more uniformly-densely|after etching 25 min,the sizes of pyramids increase again in the over-etching process.The experiments illustrate that the new additive can effectively reduce the texturing time,make an ideal textured structure,and be applied in industry.

Keywords: , Single crystal Si Micro-structure Textured structure

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