

STUDY ON THE HIGH EFFICIENCY BURIED CONTACT SOLAR CELL WITH WET ETCHING PROCESS

Dae Keun Kang^{a*}, Kang Ho Choi^a, Joo Yul Lee^a, Kyu Hwan Lee^a
^{a*}Korea Institute of Materials Science(E-mail:dasom7249@hotmail.com)

초 록: High efficiency silicon solar cell technology based on planar technology has been improved by various kinds of process by using the wet etching process. In particular, the buried contact solar cell has been successfully studied. In the present work, a simplified process of the buried contact solar cell has been suggested to help one design effectively the high-efficiency solar cell.

1. 서론

Various kinds of solar cells with high efficiency have received much interest mainly because of the exhaustion of fossil fuel and the environmental issues. In particular, the buried contact solar cell by using the mechanical grooving has featured the high efficiency characteristics. Nevertheless, this process has some disadvantages such as a large number of lengthy processing steps at high temperature, expensive equipment, and many pre-cleaning steps making the process complex and labor intensive. In this work, we suggest the useful guideline to develop the simplified buried contact solar cell process by using the wet etching.

2. 본론

The silicon wafer that was coated by Si₃N₄ was prepared for the experiment. The electrolyte was composed of Hydrofluoric acid, DI water, and Isopropyl Alcohol. Then, the electrolyte has to be examined with a usual syringe, micro silica nozzle is used, the wet etching process is carried out at a temperature of about 20~25°C, at the time value of 30sec, 45sec, 60sec, respectively. For the measurements of wet etching process for buried contact solar cell, the moving table for probe station was employed. The qualities of the wet etching process were assessed visually, optical microscopy, scanning electron microscopy, and alpha-step, in terms of shape, thickness, and etching rate.

3. 결론

In order to develop the optimum condition of the wet etching process for buried contact solar cell, experiment about the model systems have been progressing by using the etching solution with the micro silica nozzle. Therefore, experiments that are used the etching solution and micro silica nozzle will be suggested as the useful characteristic parameters.

참고문헌

1. Z. Yuwen et al., Solar Energy Materials and Solar Cells, 48 (1997) 167.
2. Young H. Cho et al., Solar Energy Materials and Solar Cells, 48 (1997) 173.
3. D. S. Kim et al., Solar Energy, 17 (1997) 17.
4. J. F. Nijs et al., Solar Energy Materials and Solar Cells, 65 (2001) 249.
5. M. McCANN et al., Prog. Photovolt: Res. Appl. 16 (2008) 467.