UMG 실리콘 태양전지의 패시베이션 공정 연구

장효식, 김유진, 김진호, 황광택, 최균, 안종형*
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Optimization of Passivation Process in Upgraded Metallurgical Grade (UMG)-Silicon Solar Cells

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Abstract : We have investigated the effect of forming gas annealing for Upgraded Metallurgical Grade (UMG)-silicon solar cell in order to obtain low-cost high-efficiency cell using post deposition anneal at a relatively low temperature. We have observed that high concentration hydrogenation effectively passivated the defects and improved the minority carrier lifetime, series resistance and conversion efficiency. It can be attributed to significantly improved hydrogen-passivation in high concentration hydrogen process. This improvement can be explained by the enhanced passivation of silicon solar cell with antireflection layer due to hydrogen re-incorporation. The results of this experiment represent a promising guideline for improving the high-efficiency solar cells by introducing an easy and low cost process of post hydrogenation in optimized condition.

Key Words : Upgraded Metallurgical Grade (UMG), solar cells, Passivation, Crystalline silicon