ABSTRACT

In this work, aluminum oxide films with excellent passivation effects were prepared on the rear-side surface of passivated emitter and rear cells (PERCs) using a self-developed spatial atomic layer deposition system. Various rear-side surface morphologies were obtained through different etching treatments. We compared the PERCs with standard etching treatment and further polishing processes on rear-side surfaces. Experimental results show that compared with the unpolished cell, the polished cell attained superior electrical performance, particularly in open-circuit voltage (Voc) and short-circuit current density (Jsc), because of the more effective rear-side surface passivation and reabsorption of long-wavelength light. The improvement in Voc and Jsc raised the conversion efficiency to 19.27%. This study verifies that despite polished cells requiring complex processes, the polishing treatment displays application potential for achieving high efficiency in the solar industry.

Keywords: passivated emitter and rear cells; atomic layer deposition; surface passivation

REFERENCES


5. Saint-Cast, P.; Kania, D.; Hofmann, M.; Benick, J.; Rentsch, J.; Preu, R. Very low surface recombination velocity on ...