

Study on Surface Morphology and Reflectance of Solar Cells Applied in Pyramid Structures

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Abstract : With the advancement of technology, human activities have increased greenhouse gas emissions and fossil fuel energy production, leading to increasingly severe global warming. To mitigate global warming, energy conservation and carbon reduction have become global goals. Solar energy, a renewable energy source, not only helps achieve energy conservation and carbon reduction but also serves as an efficient energy generation method. Solar energy, derived from sunlight, is an endless and promising energy source capable of meeting high energy demands sustainably. In recent years, many countries around the world have been developing the solar energy industry, and Taiwan is no exception. Positioned in the subtropical region, Taiwan possesses geographical advantages conducive to solar energy utilization. Furthermore, Taiwan's well-developed semiconductor technology and sophisticated equipment make it highly suitable for the development of high-efficiency solar cells. This study focuses on investigating the anti-reflection properties of solar cells. Through metal-assisted chemical etching, pyramid structures are etched to allow sunlight to pass through, achieving secondary or higher-order reflections on the surface of these structures. This trapping of light within the substrate reduces reflection rates and increases conversion efficiency.

Keywords : solar cell, reflectance, pyramidal structure, potassium hydroxide

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