

Investigation of the Corrosive Chemical Interaction on Antireflective Layers of Solar Cell Multilayers

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Nowadays, the issue of solar cell durability in local weather and environment is a crucial issue. Above all, surface corrosion on solar cell multilayers is a major factor that determines the durability of commercial solar cells; corrosive chemical interactions between air, humidity and chemical species and solar cell multilayers can unfavorably affect the durability. Here, we study microscopic and spectroscopic surface techniques to investigate the corrosive interaction on the antireflective layers of solar cell multilayers under various conditions such as acid, base, constant temperature and humidity. Surface morphology and adhesion force were characterized with atomic force microscopy before and after chemical treatment. Chemical composition, and transmittance factors were studied with X-ray photoelectron spectroscopy, and ultraviolet-visible spectroscopy, respectively. Based on these studies, we suggest the dominant factors in the corrosive chemical processes, and their influences on the structural, compositional, and optical properties of the antireflective layers.

Keywords: corrosion, anti-reflective coating, glass, solar cell multilayers