

Development of solar cell encapsulants for building-integrated photovoltaics

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Building-integrated photovoltaics (BIPV) are photovoltaic systems used to replace conventional building materials in parts of the building envelope such as facades, skylights or roof. BIPV systems are increasingly being incorporated into the construction of new buildings as a principal or ancillary source of electrical power. Generally, BIPV modules are characterized by consisting of two glasses at both sides of module. Also, encapsulant is necessary to laminate the photovoltaic modules; therefore it is very important to develop enough encapsulant material to protect the very thin crystalline silicon solar cells.

In this study, we developed ethylene-vinyl acetate copolymer as an encapsulant material, especially for BIPV modules, with specific composition and morphology in a high-pressure autoclave reactor on a mass production scale. After a sheet was extruded with developed product, we put it in the BIPV modules containing thin crystalline silicon solar cells, and evaluated its performance on light transmission, adhesion property, curing efficiency and long term reliability.