Studies about the Curing Behavior of EVA in Photovoltaic Modules

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ABSTRACT

Within the framework of sustainable development the use of renewable energy sources is crucial. In the last decades, commercial production of PV-modules (photovoltaic modules) has increased considerably. A PV module basically consists of a certain number of solar cells and its electric wiring, and some back and front side protection, usually glass (frontside) and Tedlar®1,2 (backside)3. The whole sandwich is laminated by using EVA as an adhesive between the solar cell and the glass and the Tedlar® layer, respectively. The lamination process is important for the longevity of the PV-module.
In this contribution, we focus on the lamination process. During lamination, the EVA undergoes a curing reaction. To optimize the lamination, detailed understanding of the curing process of EVA is needed. This can be easily done by thermoanalytical experiments. Based on dynamic DSC experiments, we describe the curing behavior of EVA with kinetic calculations. As a result, we predict the isothermal curing behavior. These predictions have been verified by isothermal experiments. Based on these results, the actual lamination process for the PV-modules could be optimized regarding the quality of the PV-modules as well as regarding the processing conditions (time and temperature).

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