

Evaluation of the Glass Transition Temperature of EPDM by Dynamic Mechanical Analyzer

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Evaluation of the thermal properties of polymer is important for the applications in various fields. In this study, the glass transition temperature of EPDM polymer using dynamic mechanical analyzer (DMA) was evaluated in a temperature range from -100 °C to 130 °C and heating rate was (1, 2, 3, 5) K/min. The glass transition temperature was evaluated at tensile mode in 1 Hz with measuring storage modulus and the peak value of tangential curve. Commercial EPDM which has a dimension of (150 x 150 x 2) mm was selected for measurement specimens. Total ten positions in a same batch with five horizontally and five vertically were measured. As a result, averaged glass transition temperature of EPDM was -58.7 °C and relative standard deviation was 1.7 % which has enough small deviation in general polymers. Additionally, we studied the effect of changing plasticizer composition with weight percent of (0~40) % in EPDM. As adding plasticizer more in EPDM, glass transition temperature was decreased with a trend of quadratic curve. As an aspect of usage, we considered that low temperature of glass temperature was useful, but mechanical strength became weak. Thermal gravimetric analyzer (TGA) measurement up to 600 °C showed the mass loss data of thermal properties of EPDM.