

# **A NEW CONTROL TECHNIC FOR POLYMER BLEND MORPHOLOGY USING RADIATION HEATING**

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**ABSTRACT.** This paper deals with a new control technic for polymer blend morphology using infrared radiation energy. The viscosity difference between the matrix and the dispersed phase of the blend is suppressed by selective radiation heating according to the distribution of the radiation absorption coefficient of the blend components. A test blend consisting of polystyrene (matrix phase) and low density polyethylene with black carbon (dispersed phase) was mixed under a shear condition with an experimental die. A YAG laser was used as the radiation energy source. Change in the dispersion process during the mixing was visualized with a microscope camera system, and final blend morphology was precisely studied with scanning electron microscopy. As predicted in the numerically estimated temperature distribution, the results apparently showed that the proposing technic affected the dispersion process and improved the blend morphology.