Drying Behavior of Latex Dispersions Using Near-Infrared Spectroscopy

Ali Mehrabi, N. Khosravian, S.-W. Chiu, J. Torres, F. Chica,

J. M. deSantos & R. Bharadwaj

Engineering Technology Group, Avery Dennison Corp., Azusa, CA

ISCST-20180918PM-B-PC1

Presented at the 19th International Coating Science and Technology Symposium, September 16-19, 2018, Long Beach, CA, USA†.

Fast drying of latex dispersions is an important process in various industries such as coating or paint technologies. Time-resolved near-infrared spectroscopy was used to quantify the water content of thin latex films during drying in a well-controlled environment (with a prescribed air velocity and temperature). A new de-trending process was also developed to correct the raw spectra and to remove artifacts caused by various perturbances. Using a physical model for the drying process and by precisely controlling the external drying conditions (heat and mass transfer in the air), the internal drying parameters (diffusion of water inside the latex film at various stages during packing and film formation) were well characterized for several commercially-available latices having different glass transition temperature and particle size and particle-size distribution. Using internal parameters, the drying behavior of these latices were predicted at different external drying conditions.