

International Conference on

Polymer Science & Engineering

August 22-24, 2016 New Orleans, USA

Effect of dispersion process and anionic to non-ionic ratio on properties of waterborne polyurethane dispersion

Suresh Kolekar

Pidilite Industries Ltd, India

Water-based polyurethane dispersions (PUD) were prepared by acetone process by varying the ratios of two different internal emulsifiers which were anionic and non-ionic. These further were studied by changing the dispersion process viz, direct and reverse process. It was found that PUD of the similar composition was made with direct process (water in oil addition), and reverse (oil in water addition) displayed different particle size, drying time, hardness, elongation, molecular weight and gloss. The increasing trend was observed in tensile strength, elongation, drying time, gloss and water resistance w.r.t. increase in the non-ionic content. Whereas, decreasing trend was observed in particle size, pendulum hardness and electrolytic stability. In similar set of experiments, PUD made with direct process displayed poor solvent resistance, electrolytic stability, improved hardness and water resistance compared to reverse process. However, tensile strength and elongation were unaffected by the process variation. The unusual trend was observed in particle size and viscosity in direct and reverse process. PUD prepared by reverse process showed lower particle size and viscosity than those synthesized with direct process. Moreover, it was also observed that the weight average molecular weight (M_w), storage and loss modulus (on Rheometer) also gets significantly affected by the dispersion process. Also, the phase inversion study reveals that time to achieve the phase inversion stage decrease with increase in non-ionic content.

Biography

Suresh Kolekar completed his Doctorate in Polymer Chemistry in 1999 from University of Mumbai and Post-doctoral degree at Southern Mississippi University School of polymer Science and High Performance Materials, USA. Presently he is working as Head-R & D New technology development-Pidilite Industries Ltd., since October 2013. He has significant exposure in research, management skills, technology, capabilities development and interpreting research results and technical data. He has proven track record of participating in various research projects with real-time experience in planning, execution, application of methodologies, documentation and presentation of findings. He also has hands-on experience in various chemistries and their application in areas like paint, textile, leather and wood, acrylic emulsion synthesis, oil modification (sulfonation, sulfitation, esterification, etc.), polyurethane dispersion synthesis and scale up at pilot plant, silicone and amino silicone emulsion (softeners for textile substrate), exterior paints formulation and for decorative application. He has 17 years of professional experience.

suresh.kolekar@pidilite.com

Notes: