**Effect of DMPA Content on Colloidal Stability of Jatropha Oil-based waterborne Polyurethane Dispersion**

**ABSTRACT**

Driven by the increase of oil price in the market as well as environmental concerns by the society, a renewable raw material such as vegetable oil becomes the alternative to produce bio-based polyol to replace non-renewable polyols in polyurethane production. The recent development of aqueous polyurethane dispersion proves that environmentally waterborne PUD offers an efficient alternative to the solvent-borne PUD for the application in ink, adhesives, and coatings. In this study, the jatropha oil has been successfully functionalized to polyol (JOL) by epoxidation and oxirane ring opening steps. Jatropha oil-based waterborne polyurethane (JPU) dispersions were produced by polymerizing the JOL with isophorone diisocyanate (IPDI) and dimethylolpropionic acid (DMPA). The colloidal stability of JPU dispersions was studied in terms of particle size and zeta potential. Varying DMPA content from 5.0-7.0 wt.% resulted in small average particle size of dispersion from 39.40 nm to 133.2 nm. High zeta potential obtained in a range of -52 mV to -65 mV indicates the particles in the dispersion are sufficiently separated and therefore stable. Eventually, the study provides an overview of vegetable oil-based waterborne polyurethane dispersion with good stability for surface coating application.