Effect of Nano-sized Core- shell Rubber (CSR) Particles on Impact Peel Strength of epoxy-based structural Adhesives at Low Temperature

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Many efforts have been made to improve the mechanical properties of epoxy-based structural adhesives at low temperature. Highly toughening system at low temperature can be achieved by introducing nano-sized core shell rubber (CSR) particles (about 150-200nm in diameter) into epoxy systems. Various methods to disperse CSR particles into epoxy systems were introduced. By incorporating CSR particles into epoxy systems, adhesion strength (T-peel strength)and impact peel strength at low temperature(-40℃) significantly increased. Furthermore, amine terminated-epoxy was synthesized and used to improve wetting properties at the substrate surface. CSR/amine-modified epoxy systems were cured at 160℃ for 20 min for the application to automotive body structures. Prepared adhesives were characterized by using impact peel test machine, SEM, TEM, and contact angle measurement in this work.