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Abstract
In this research, organic/inorganic nanocomposite was prepared from acrylic-polyurethane matrix with direct addition of modified silica.
Two type of nano-colloidal silica dispersed in difference solvent are grafted with 2-HEMA, the 2-HEMA-g-silica was the polymerized with acrylic monomer forming acrylic polyol.
By cross-linked the polyol with polyisocyante, the resultant nanocomposite was used as coating material and has excellent properties in surface hardness, solvent resistance as well as high Tg. However, the surface of coated film tends to loss its gloss with increasing silica content.
The second approach to increase interface strength between the two phases was to pre-react the SiO2 particles with polyisocyanate. In this approach, the functional group of -NCO in polyisocyanate was partially reacted with the functional group of -OH on the surface of silica, the reaction was accelerated by the addition of catalyst. A significant improvement in solvent resistance was observed. In addition, the surface of coated film was smooth and glossy.
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