

### Synthesis and Characterization of Polyurethane/Clay Nanocomposite

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Clay / polyurethane nanocomposites were synthesized from covalent bond between clay and polymeric 4,4' diphenylmethane diisocyanate (PMDI) by in-situ intercalation process. Silanol group of clay and NCO group of PMDI were reacted for 24 hours, 3000 rpm maintaining 50°C. The FT-IR analysis of the modified clay demonstrated that NCO characteristic peak was observed in FT-IR analysis of the modified clay after modification reaction. The  $2\theta$  of the nanocomposite synthesized with the modified clay was disappeared. The flexural and tensile strength of the clay/polyurethane nanocomposite using the modified clay showed that the maximum strengths were with 3 wt % of the modified clay. The Tg of the nanocomposite decreases with an increase in the modified clay. We suggest that the decrease in the Tg of the clay/polyurethane nanocomposite with the modified clay content might be due to an increase in the chain flexibility of polyurethane backbones.

Acknowledgement: This research was supported by a grant (code BC1-102) from Carbon Dioxide Reduction & Sequestration Research Center, one of the 21st Century Frontier Programs funded by the Ministry of Science and Technology of Korean government.