

Polyethylene/Clay (Kunipia-F) Nanocomposite prepared by *in-situ* polymerization with titanium pillared clay activated by $\text{Al}(i\text{-Bu})_3$

Liqiang Cui^{1,2}, 조현용^{1,2}, 홍대식^{1,2}, Naresh Hiralal Tarte^{1,2},
우성일^{1,2,*}

¹한국과학기술원; ²초미세화학공정시스템 연구센터(CUPS)
(siwoo@kaist.ac.kr*)

Polyethylene (PE)/clay nanocomposites were prepared by *in-situ* coordination polymerization using titanium pillared clay (Kunipia F) catalyst activated by $\text{Al}(i\text{-Bu})_3$. The nanostructures of the composites were studied by X-ray diffractometry (XRD) and transmission electron microscopy (TEM). The XRD patterns of the PE/clay nanocomposites indicated that the characteristic diffraction peak of the clay disappeared. The TEM images showed that the clay were fully exfoliated into nanometer sizes and dispersed uniformly in the PE matrix. The laminated structure of clay lowered the polymerization rate, producing polymer of a high molecular weight. The crystallinity of the nanocomposite was decreased, whereas the thermal stability was significantly improved compared to that of virgin PE of comparable molecular weight. The decomposition temperature was decreased upon increase of the clay loading in PE matrix.