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The advanced properties of the PET Nano-composites with various LDHs

PET is hydrophobic and semi-crystalline polyester due to the presence of the aromatic ring in the polymeric structure. It shows high melting point and very good mechanical strength even numerous excellent properties such as good flexibility, thermal stability, fatigue resistance, high crystal-melting temperature, and low cost, etc. In recent years there is an increasing interest for the preparation of PET nanocomposites due to their extensive properties. The main industrial PET production is usually carried out two ways (a) bis-(2-hydroxyethyl) terephthalate (BHET) oligomerization, (b) esterification of terephthalic acid (TPA) or dimethyl terephthalate (DMT) with ethylene glycol (EG) by zinc or manganese acetate or Antimony compound as a catalyst. However, residual heavy-metal catalysts in PET products are harmful to the health, particularly when used in food or beverage packaging. Thus, without addition of the heavy-metal catalyst, the development of a new method for the rapid polymerization of PET synthesis is desirable. Fortunately, organically modified nano-fillers (LDHs) provide an opportunity to solve the above mentioned problems. According to our previous research, we developed organo-modified various LDH used as a new catalyst without heavy metals to prepare new type of PET nanocomposites by *in-situ* preparation method. PET/LDH nanocomposite morphologies were determined by XRD, TEM. TEM and are exfoliated and intercalated with the layer by the PET molecules during *in-situ* polymerization with various LDHs. This effect could be attributed to the better thermos mechanical, gas barrier properties of PET/LDH nanocomposites.

Biography

Tsung Yen Tsai has completed her PhD from Texas A&M University in 1996. She worked for ITRI, Taiwan for 6 years as the division Director and then transferred to Chung Yuan Christian University since 2002. She is the distinguished Professor of Chemistry department. She has published more than 45 papers in SCI journals, over 35 patents and has been serving as the Project Director to develop the pilot of new nanocomposites, cooperated with more than 30 companies.

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