allied academies

International Conference on

Nanomaterials and Nanochemistry

November 29-30, 2017 | Atlanta, USA

Conductive Ppy-DS/Fe-MMT layered nanocomposites

H Enomoto
Osaka Electro-Communication University, Japan

Conductive polypyrrole/montmorillonite (Ppy/MMT) nanocomposites were synthesized by the *in-situ* polymerization of Ppy in the gallery of MMT layers. The constrained environment of the interlayer gallery of clay host is expected to serve as a template within which a guest molecule is assembled, and to realize a high degree of polymer ordering. Fe^{3+} ions were intercalated into MMT gallery prior to the *in-situ* polymerization of Ppy. Sodium dodecyl sulfate (DS:Na) was adopted as a dopant of the conductive Ppy polymer. XRD patterns showed that all samples contain an organic polymer between all individual MMT sheets. Electrical conductivities are increasing with an increase of the basal-plane distance of nanocomposites, which indicates that the arrangement of Ppy polymer changes in the MMT gallery. The dc resistivity of Ppy-DS/Fe-MMT nanocomposites showed semiconductor-like temperature dependence. Through the variable range hopping (VRH) analysis, two-dimensional conduction is found to occur in Ppy-DS/Fe-MMT layered nanocomposites at lower temperature, although the pristine Ppy-DS polymer shows three-dimensional conduction. This is caused by two dimensional alignment of Ppy in MMT sheets, which suggests that the interlayer gallery of MMT serves as a template of Ppy arrangement.

Speaker Biography

H Enomoto has completed his Ph.D from Waseda University, Japan and Professor of Osaka Electro-Communication University (OECU), Japan. He was a Visiting Scientist of Oregon State University from 2000 to 2001. He has published more than 50 papers. He is a project leader of the Fundamental Electronics Research Institute of OECU.

e: h-enomot@osakac.ac.jp

Notes: