



## **A NEW ANTISOLVENT APPROACH TO MODIFICATION OF CARBON NANOTUBES USING SUPERCRITICAL CARBON DIOXIDE**

**Z.W. Zhang, Q. Xu, Z.M. Chen, J. Yue**

*College of Materials Science and Engineering, Zhengzhou University, Zhengzhou 450052, China*

*qunxu@zzu.edu.cn*

Modification of multiwalled carbon nanotubes (MWCNTs) was investigated from solution of high density polyethylene (HDPE) in conventional organic solvent p-xylene using antisolvent deposition with supercritical (SC) CO<sub>2</sub>. The technique was conducted in SC CO<sub>2</sub> under 9 MPa at 110 °C and under 12 MPa, 15 MPa at 120 °C. Both field emission scanning electron microscopy (FESEM) and high-resolution transmission electron microscopy (HRTEM) were used to study the morphology, crystallization behavior of the resulting products. PE lamellar crystals are perpendicular or oblique to the MWCNTs axis, forming a “lamellae staggered structure.” MWCNTs are wrapped and modified with layers of PE lamellae. The effect of PE concentrations was investigated and SEM has demonstrated that the size of lamella is due to the competing result of SC CO<sub>2</sub> antisolvent action and PE concentration. We anticipate that this work could be attributed to the further development of polymer/CNTs nanocomposites.