Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Adjusting microstructure and properties of polypropylene nanocomposites through *in situ* interfacial reaction[1] TAO TANG, YUJIE WANG, DONG WAN, XIN WEN, Changchun Institute of Applied Chemistry, CAS — In this report, polypropylene (PP) nanocomposites, in which the interfacial reaction between PP and nanoparticles was *in situ* mediated by peroxide, were prepared by melt mixing method. Carbon nanotubes (CNTs) showed a well dispersed state in the resultant nanocomposites. Interestingly, aligned morphology of CNTs appeared in PP/CNTs nanocomposites in the presence of peroxide and tetrabenzylthiuramdisulfide (TBzTD). We found that two kinds of interfacial interaction between PP chains and CNTs, including chemical linking between two components and π-π interaction between the grafted TBzTD to PP chains and CNTs, showed a synergistic effect on enhancing stress sensitivity of CNTs. As a result, the responsive ability of CNTs in PP matrix to external stress field becomes strong. In this case, CNTs can be easily oriented in PP matrix under weak stress field, such as mold-pressing and injection molding. The resultant nanocomposites have shown more than three times impact strength as pristine PP.

[1]This work is financially supported by the National Natural Science Foundation of China.

Tao Tang
Changchun Institute of Applied Chemistry, CAS

Date submitted: 31 Oct 2012 Electronic form version 1.4