High-k polymer/carbon nanotube composites based on polyhedral oligomeric silsesquioxane matrix facilitated by ionic liquid

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Supporting Information

In order to prove the crosslinkable reaction of POSS on the surface of iCNT and see the layer of POSS induced by IL, we design a model experiment in solvent as following:

Octa-methylmethacrylate POSS (50 mg) was dissolved in 100 mL of DMF. The solution was poured into a three-necked round-bottom reaction flask with 50 mg of iMWNTs. After magnetic stirring dispersion for 30 min, the BPO (5 mg) was added to the mixed dispersion. The temperature of the mixture was kept at 80 °C for 6 h under a nitrogen atmosphere. The mixture was then cooled to room temperature, filtered through a 0.22 μm PTFE membrane, and washed with DMF and $CHCl_3$ to remove impurities.

The sample was dispersed in DMF then dropped in the micro grid. The morphology of the coated iMWNTs was carried out by transmission electron microscopy (TEM, Tecnai $G^2$20) and shown in Figure S1. The image of POSS coated iMWNT in solvent system reveals that attachment of octa-methylmethacrylate POSS

produces a shell (shown in arrow) sidewall in the iMWNTs. The experiment shows the fact that a barrier layer of POSS was induced on the CNTs facilitated by IL. On the basis of this experiment, we prepared a supporting information as a separated file.

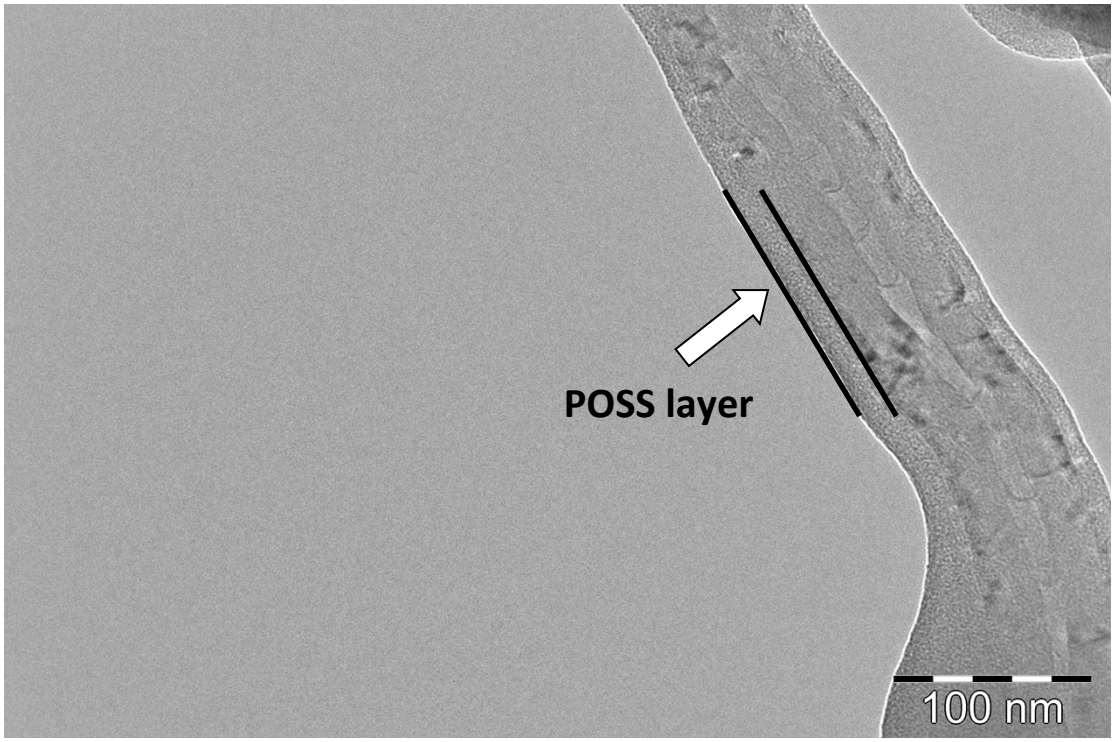

Figure S1 TEM image of POSS coated iMWNT in solvent system