Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

Fracture Toughness and Failure Mechanisms in Un-vulcanized and Dynamically Vulcanized PP/EPDM/MWCNT Blend Nanocomposites

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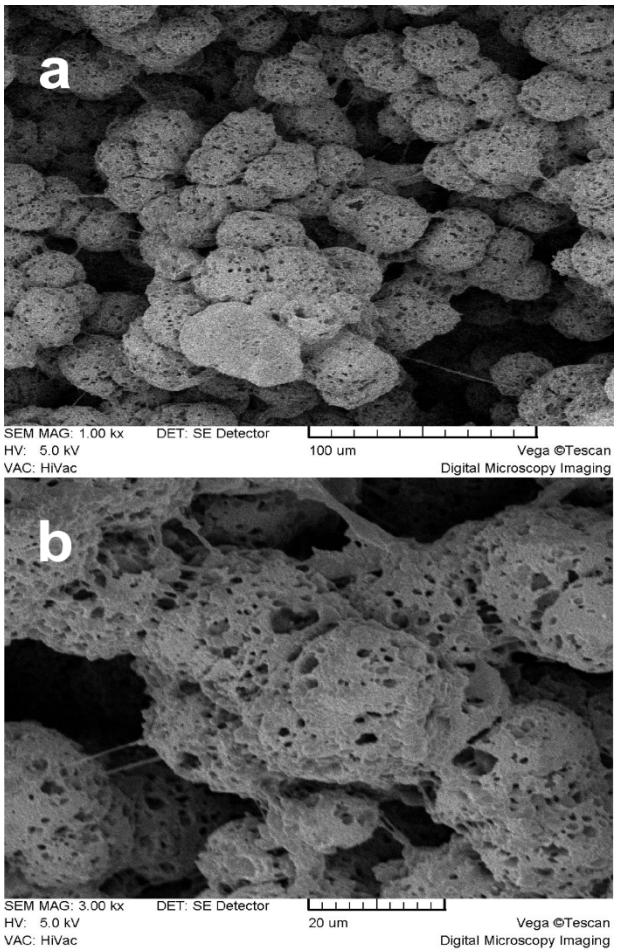

Figure S1 SEM micrographs of cryo-fractured surface of vulcanized PP/EPDM with different magnifications.

Figure S1 shows the SEM images of cryo-fractured surface of vulcanized PP/EPDM blend at two magnifications. This surface was etched by boiling xylene for 30 sec prior to SEM analysis to remove the PP phase in order to get clear observation of the

vulcanized EPDM phase. As shown in this figure, large size particles with rough surfaces appear in the cryo-fractured surface of vulcanized PP/EPDM blend. From higher magnification image (**Figure S1b**) it could be deduced that the large particles are aggregates of even much smaller rubber particles. The agglomeration of EPDM dispersed particles during the etching of PP phase, could originated from high temperature used for dissolving of the PP matrix in xylene and also high surface area of the EPDM dispersed particles. Based on agglomeration of EPDM phase and also dissolving of MWCNTs that are dispersed in the matrix during PP etching process, etched cryo-fractured surfaces of vulcanized blends and blend-nanocompoaites do not provide a proper insight of phase morphology and also cannot give an understanding about the effect of PP-g-MA on the dispersion state of MWCNTs and EPDM particles.