

# Supplementary Materials

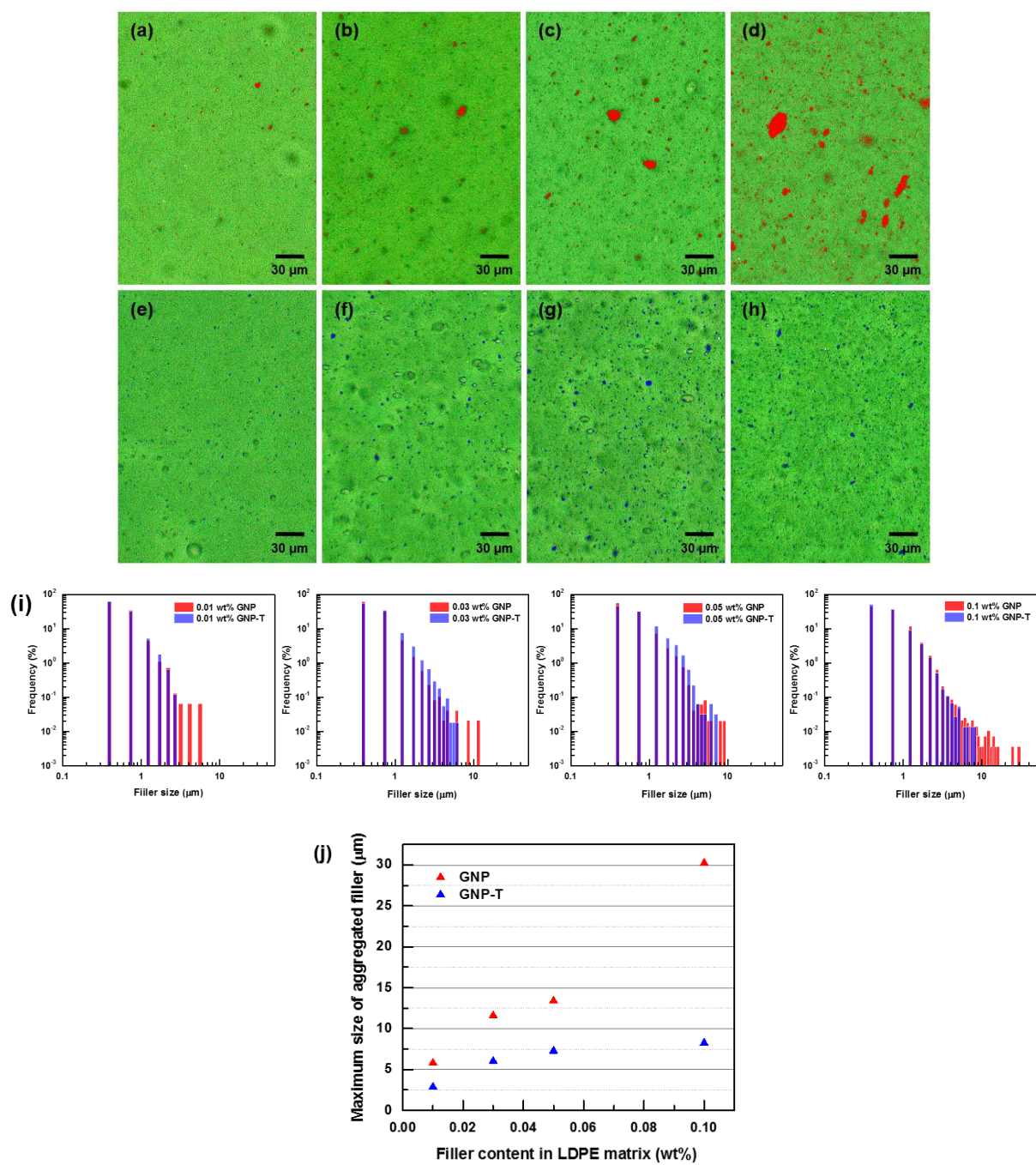
## **Polyethylene/Graphene Nanoplatelet Nanocomposite-Based Insulating Materials for Effective Reduction of Space Charge Accumulation in High-Voltage Direct-Current Cables**

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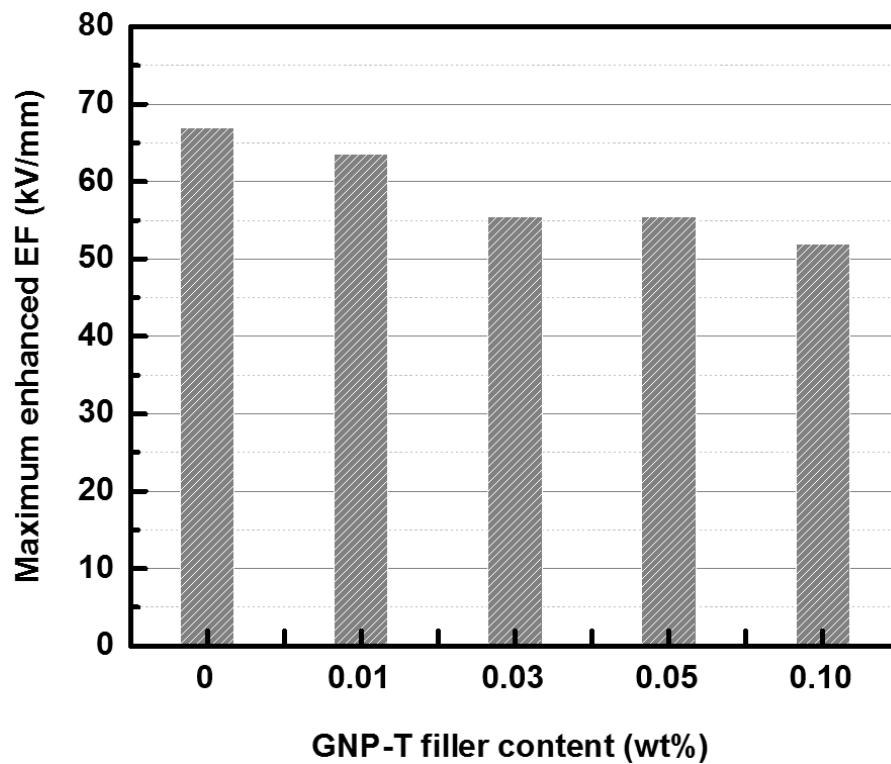
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**Figure S1.** Digitally-processed optical microscope (OM) images of LDPE nanocomposites with pristine GNPs ((a) 0.01 wt%, (b) 0.03 wt%, (c) 0.05 wt%, (d) 0.1 wt%) and GNP-T ((e) 0.01 wt%, (f) 0.03 wt%, (g) 0.05 wt%, (h) 0.1 wt%) fillers. (i) Size distribution of GNP and GNP-T fillers in LDPE nanocomposites. (j) Plot of maximum size of aggregated filler as a

function of filler content in the LDPE matrix.

In order to analyze the OM images accurately, a commercial image processing tool (Image-Pro® Analyzer, version 7, Media Cybernetics, Inc., USA) was used to measure the average size of GNP fillers in the LDPE nanocomposites. For accurate processing, a sharpening process was performed once to highlight the GNP fillers in the OM images. The GNP fillers in the filtered images were selected and then highlighted in red and blue. Statistical data on the average size of GNP fillers were computed from the digitally processed OM images.



**Figure S2.** Plot of maximum enhanced electric field of LDPE/GNP-T nanocomposites as a function of filler content.