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**The excel file contains experimental data for the paper. In particular:**

**Fig.1** FTIR spectra of a) triethoxy(octyl)silane b) silica c) triethoxy(octyl)silane functionalised silica.

**Fig.2** The derivative mass as function of temperature for a) unwashed functionalised (+1 off set) b) washed functionalised c) untreated silica nanoparticles (+2.5 offset).

**Fig.3** Estimates and two-sided 90 % confidence intervals for distribution percentiles used in Weibul plot of breakdown data.

**Fig. 4** Weibull breakdown parameters for composites containing functionalized (PEx/C8Si/13) and un-functionalized (PEx/Si/7) silica: alpha value at start and after drying are normalised to PE sample; the numerical beta-value for each data set.

**Fig.5** The electric field calculated from applied voltage and corresponding DC-conductivity of different materials when 10 V/s ramp rate was used at 30 °C

**Fig.6** The electric field and corresponding DC-conductivity using SCLC model and the experimental values for electric field calculated from applied voltage and corresponding DC-conductivity when 10 V/s ramp rate was used at 30 °C for xylene processed LDPE (PEx)

**Fig.7** The electric field and corresponding DC-conductivity using SCLC model and the experimental values for electric field calculated from applied voltage and corresponding DC-conductivity when 10 V/s ramp rate was used at 30 °C for xylene processed LDPE composite containing 13wt% of octyl-functionalized nanosilica (PEx/C8Si/13).

**Date of data collection:** from December 2015 to April 2016.

**Information about geographic location of data collection:** University of Southampton, U.K.

**Date that the file was created:** September 2016