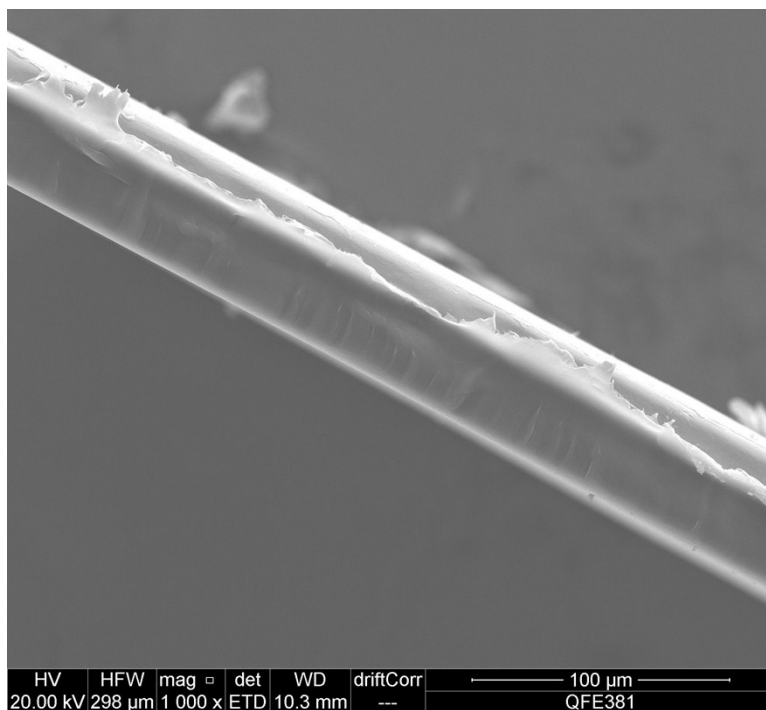
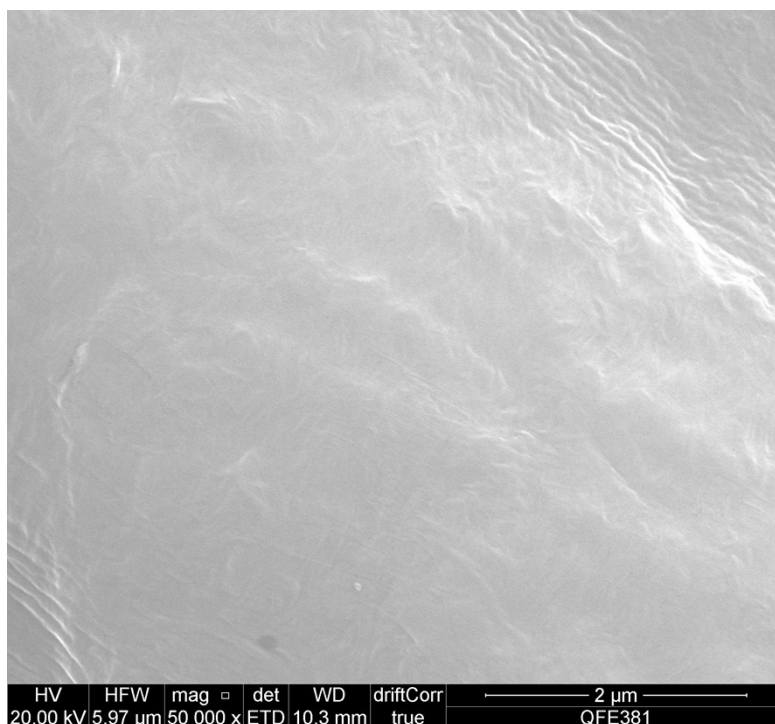


### Supplementary Information S1

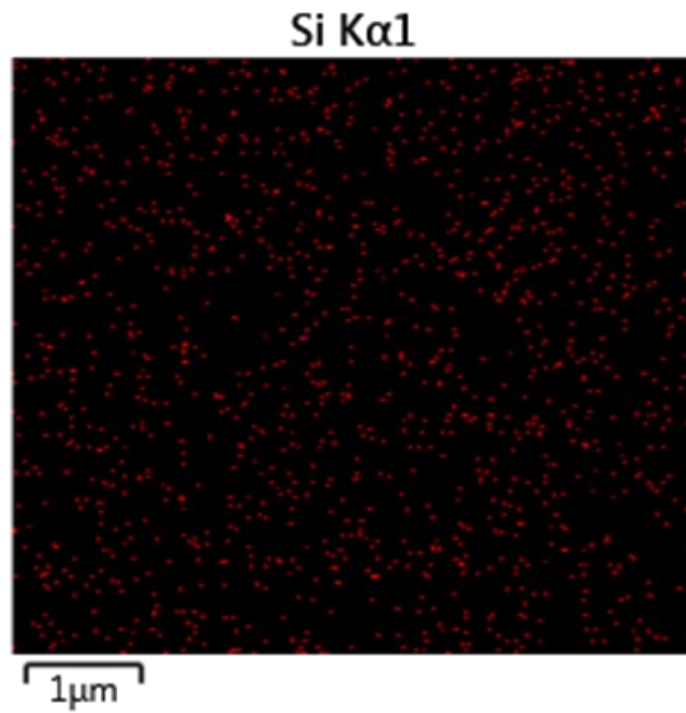
SEM micrographs of a typical HPTS-LDPE film, recorded using a SFEI Quanta FEG - **Environmental Scanning Electron Microscope (E-SEM)** with EDX, elemental analysis attachment.



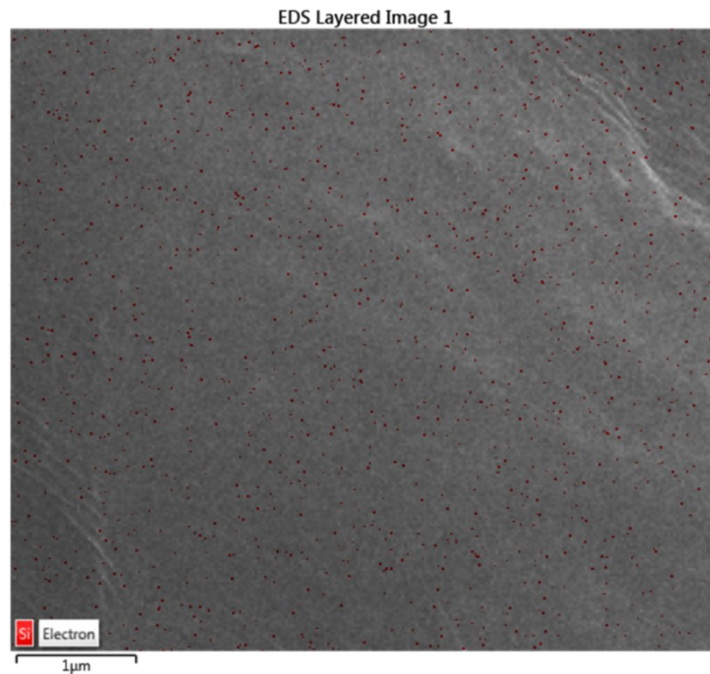
SEM side on view of HPTS/LDPE film



Close up of film



EDX image of previous SEM for Si K $\alpha$  line showing, in red, the distribution of SiO<sub>2</sub> particles throughout the film



Alternative image of EDX for Si K $\alpha$  data above.