Electronic Supporting Information

Particle tuning and modulation of the magnetic/color synergy in Fe (II) spin crossover/polymers nanocomposites in a thermochromic sensor array

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As mentioned in the manuscript, the unexpected properties and interactions of the spin crossover material can depend on its morphology size, shape and the possible interactions with the surrounding environment. The spin crossover material has a predominant particle size at around 500 nm with a low population near 1 micron. (See HRTEM image below, scale bar corresponds to 500 nanometers (Figure S.1))

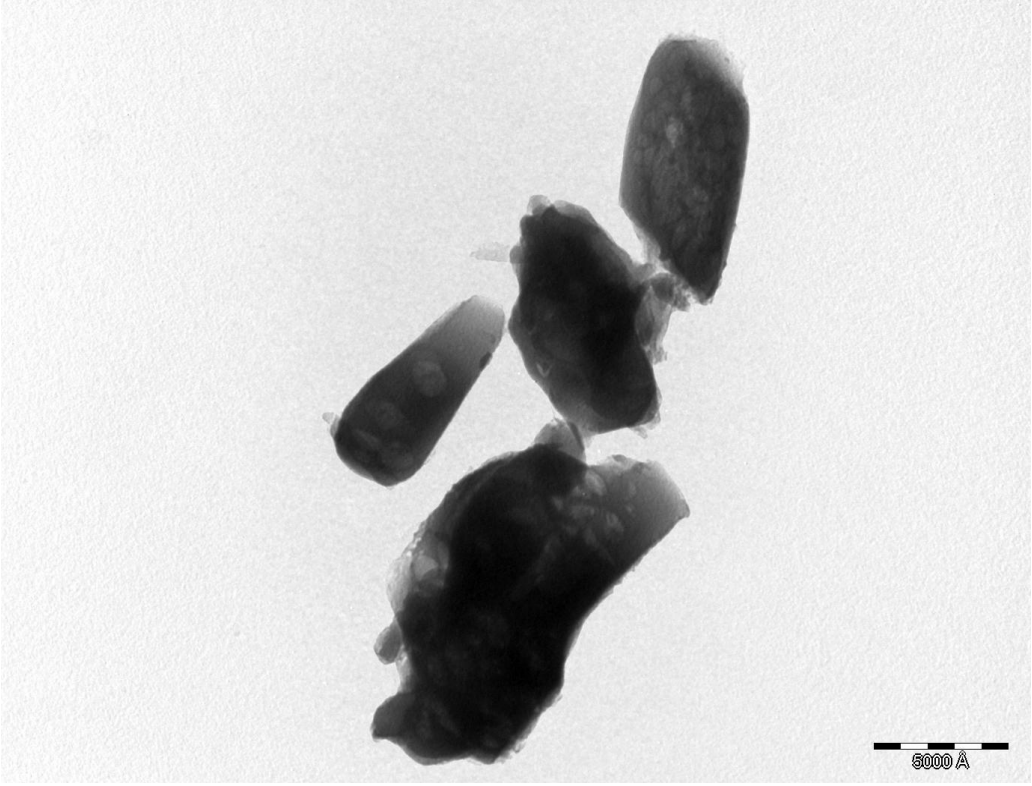

Figure S.1. Visualization by HRTEM of the SCO material.

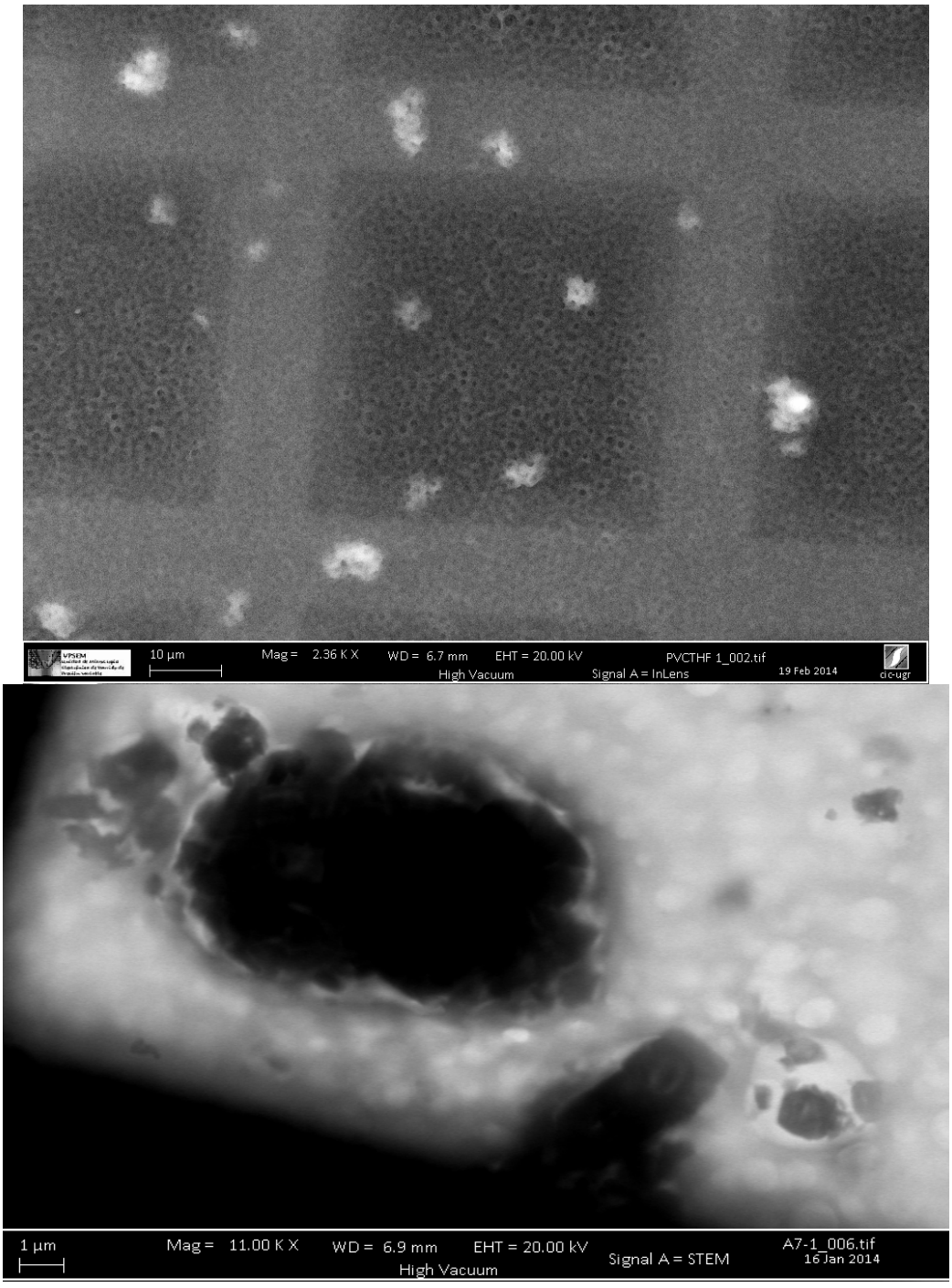

Figure S.2 is Figure S.2. SCO/PVC hybrid material. The cluster formation due to single SCO crystal aggregation when using PVC. Moreover the porosity in the polymeric films is due to the use of THF as solvent.

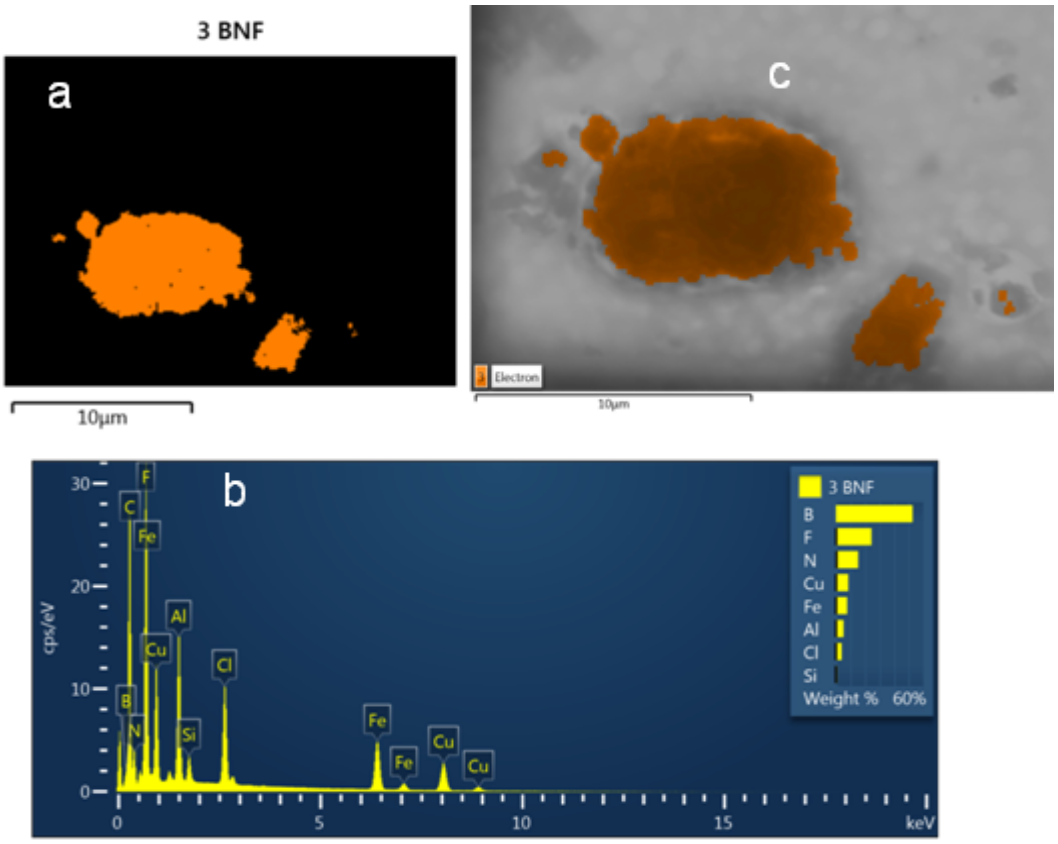

Figure S.3. Microelemental analysis for SCO/PVC hybrid material as extension of the analysis of the Figure 3.c and 3.d. It can be seen the elemental mapping for B, N and F and the correspondence with the STEM image.

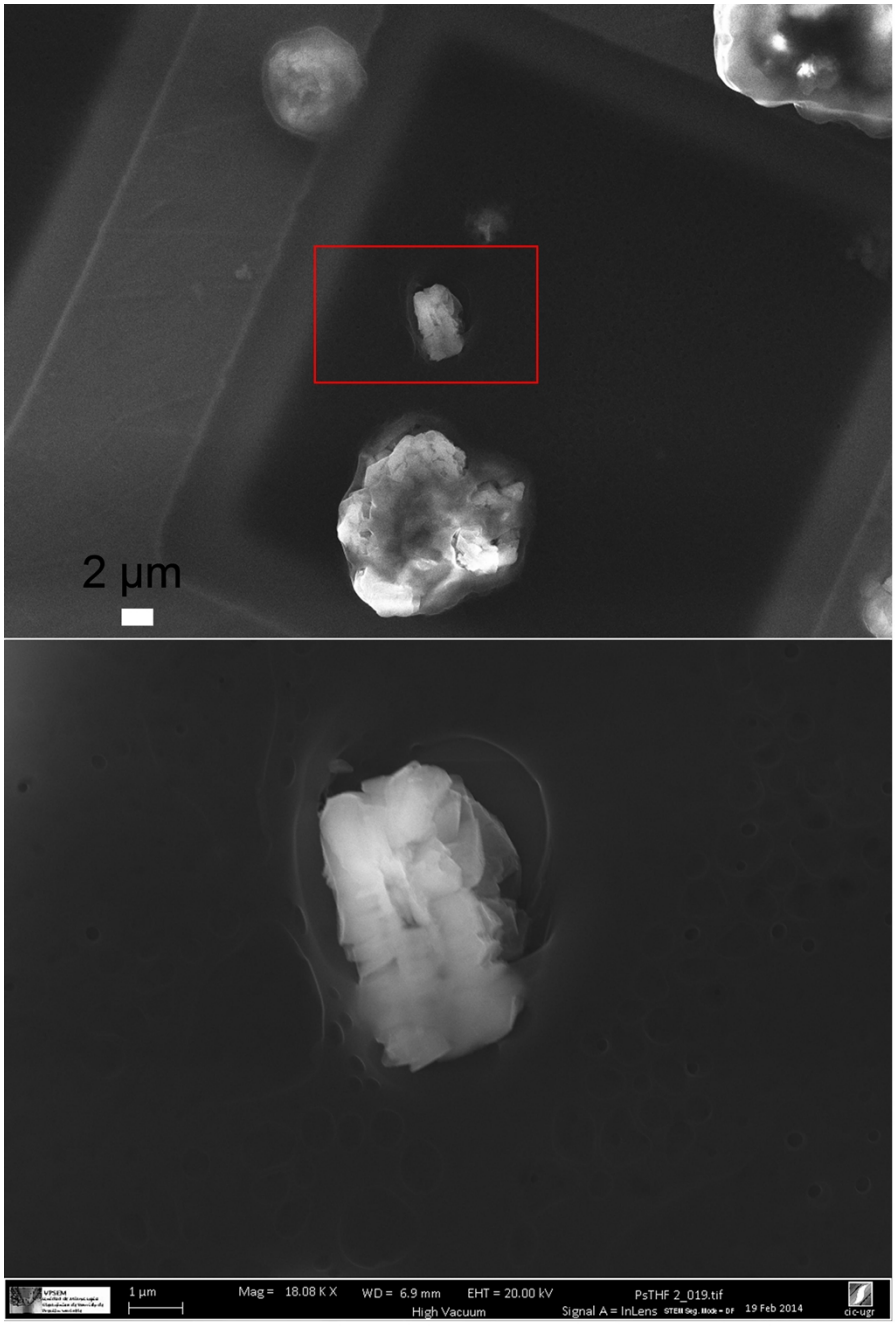

Figure S.4. SCO/PS hybrid material. Figure shows the 10 µm cluster and bellow can be seen the morphological characteristics corresponding to SCO particle aggregates. Moreover the porous in the PS film are due to the THF.

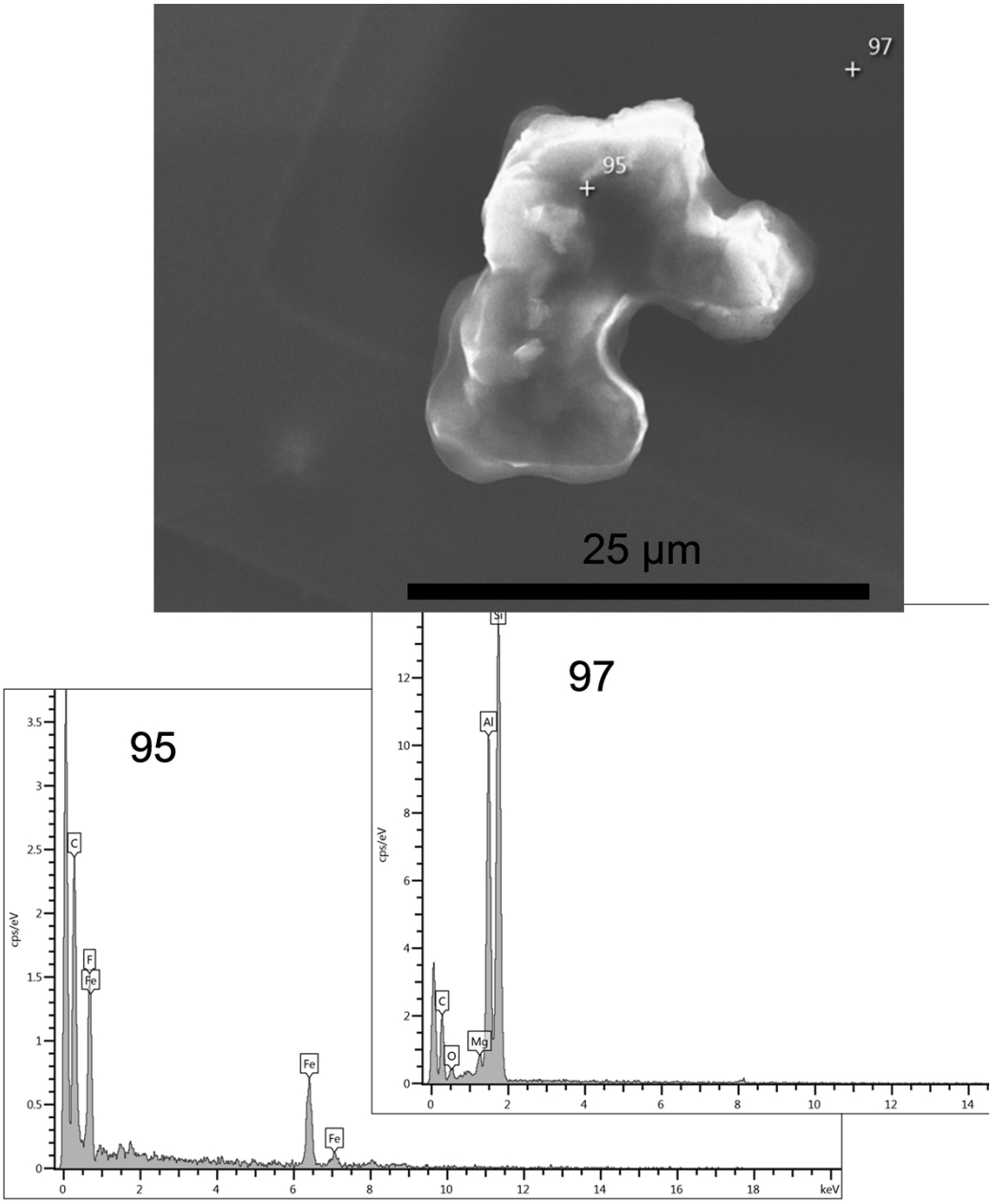

Figure S.5. Microelemental analysis for the SCO/PS hybrid material in the background (97) and on the material surface (95). The characteristics elements of the SCO material such as F and Fe are not observed in the background.The presence of C is assigned to the PS. On the other hand, mainly C and O were observed in the background which involves the SCO crystals are not affected by dissolution processes

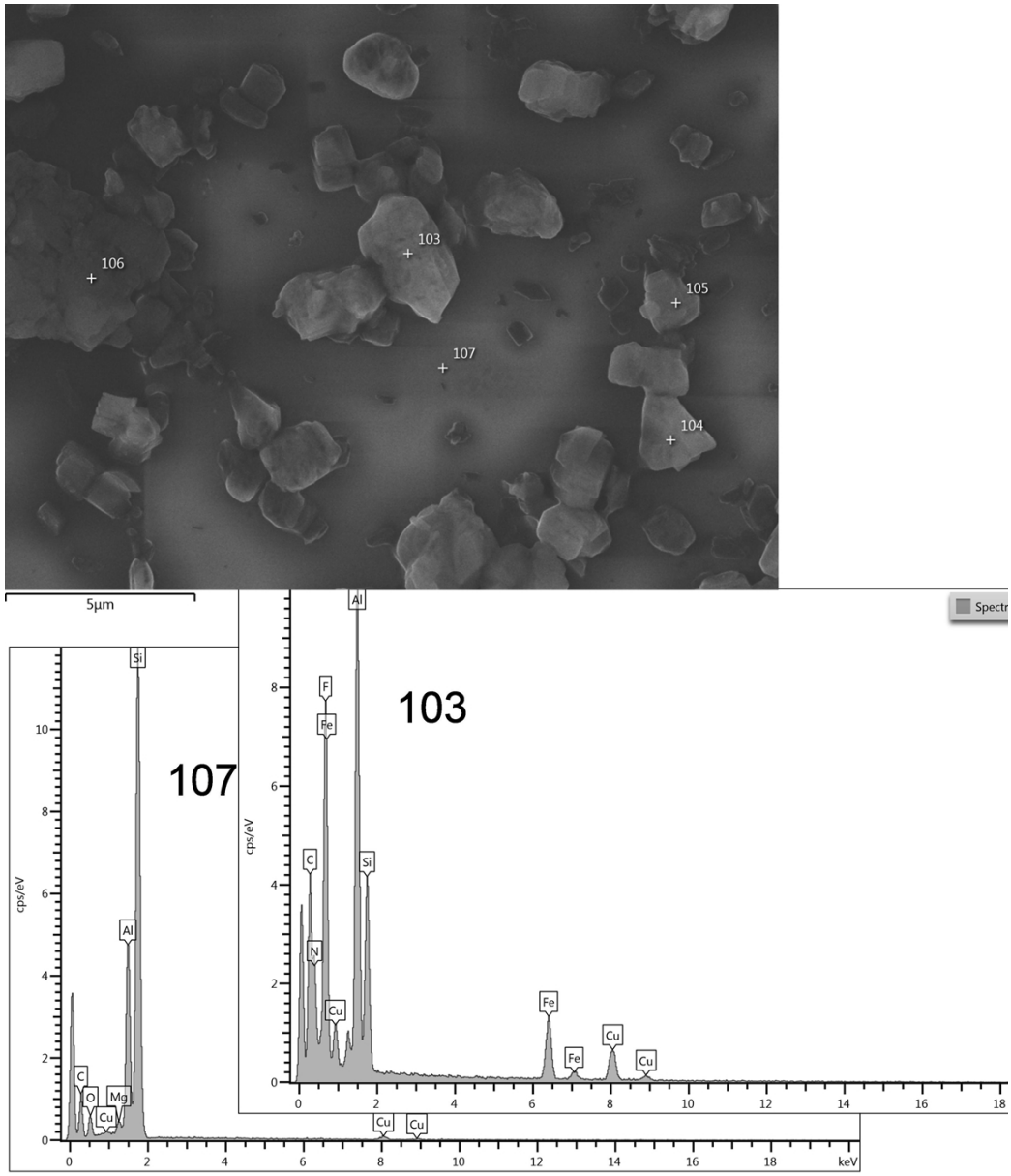

Figure S.6. Microelemental analysis for the SCO/PMMA in toluene hybrid material. In the background (107) and on the material surface (103). The characteristics elements of the SCO material such as F, Fe and N are not observed in the background (mainly C and O).

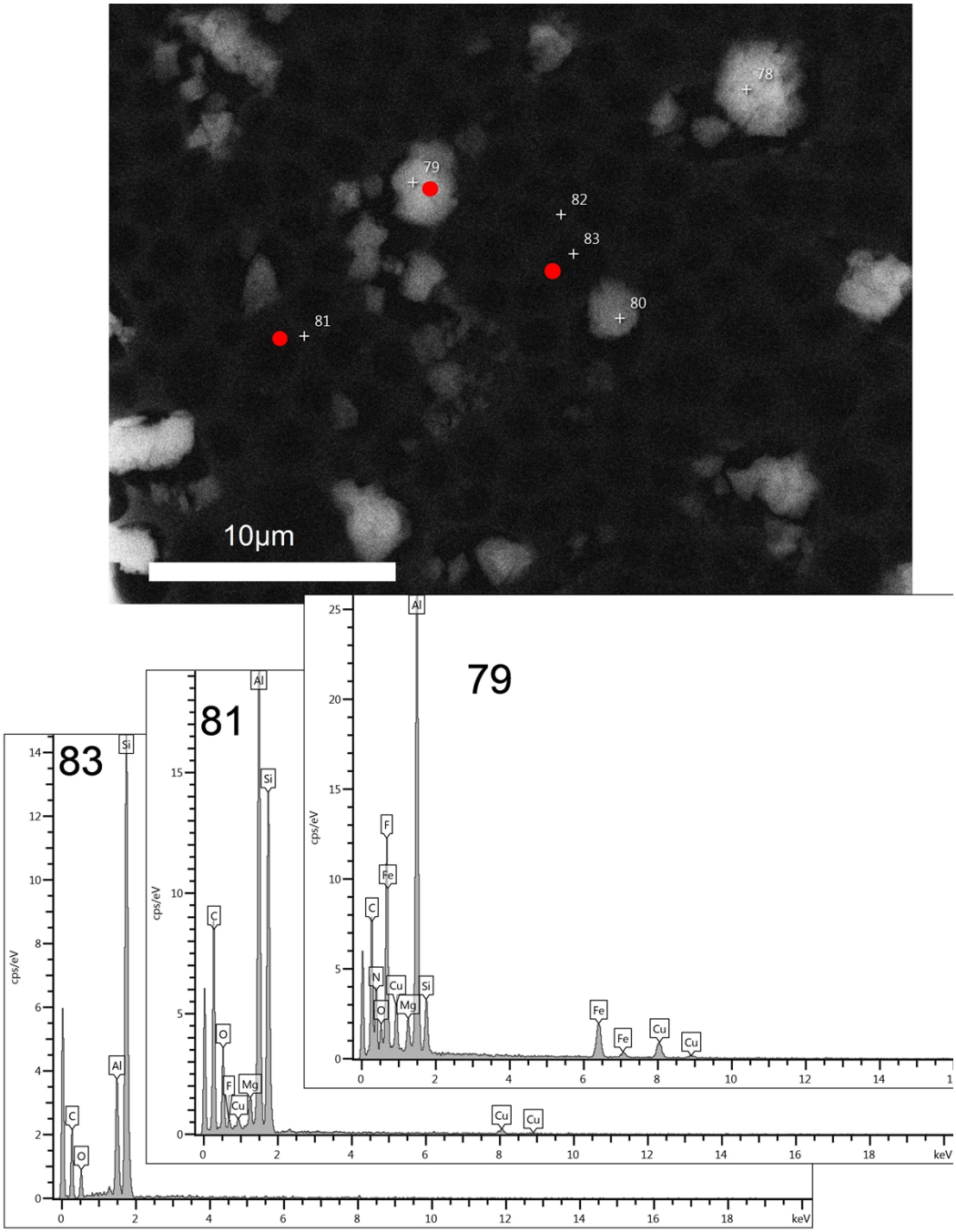

Figure S.7. Microelemental analysis for the SCO/PMMA in THF hybrid material in different localizations, (83): into the porous, (81): in the polymeric network and (79). The characteristics elements of the SCO material such as F, Fe and N are not observed neither in 83 nor 81.

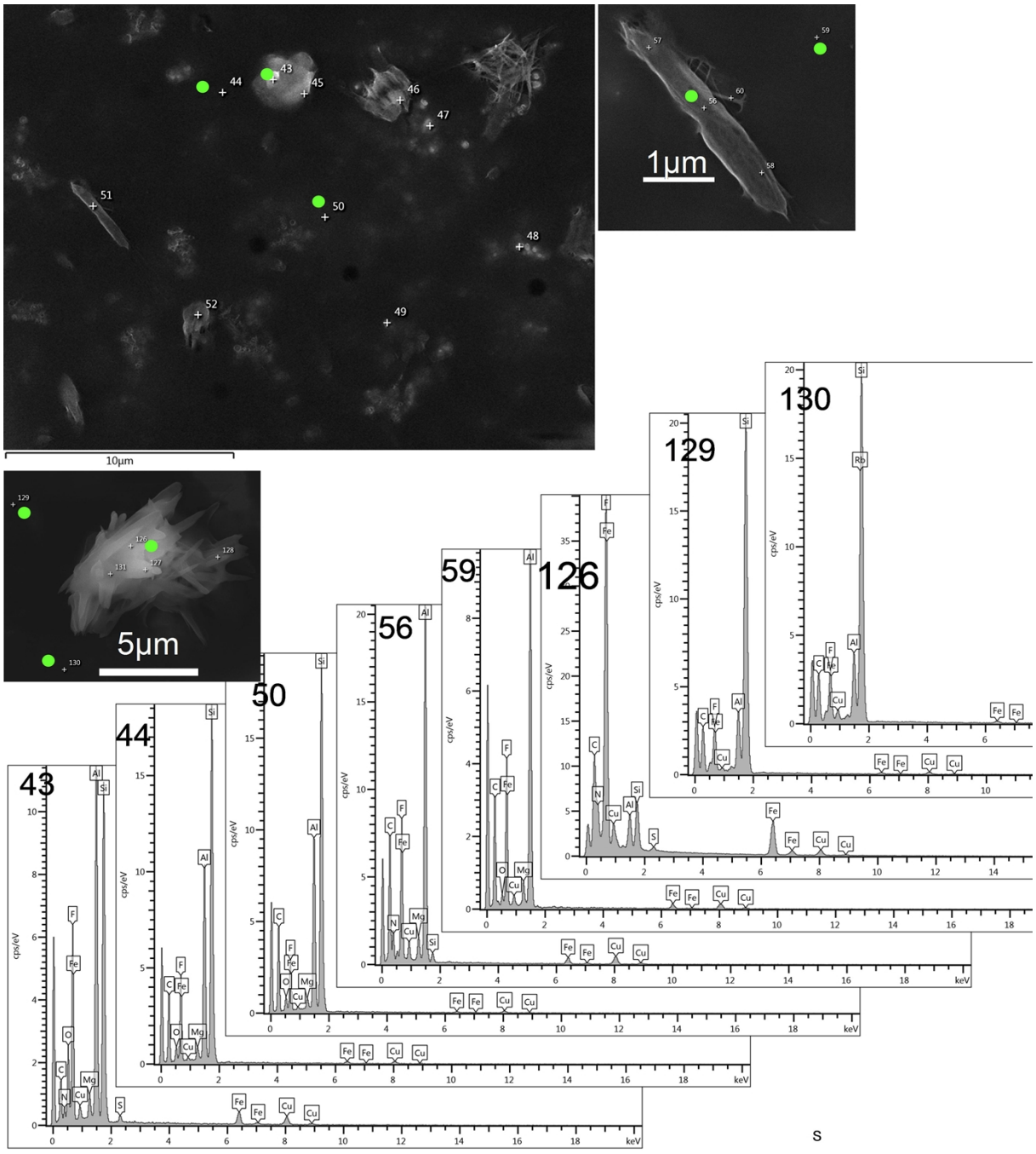

Figure S8. Microelemental analysis for the SCO/Nafion hybrid material. Located analysis points in the background (44, 50, 59, 129 and 130) reveal that iron, a common elements for the SCO material, is present involving a possible dissolution of the SCO particles and so, a subsequent morphology change to fibers like particles.

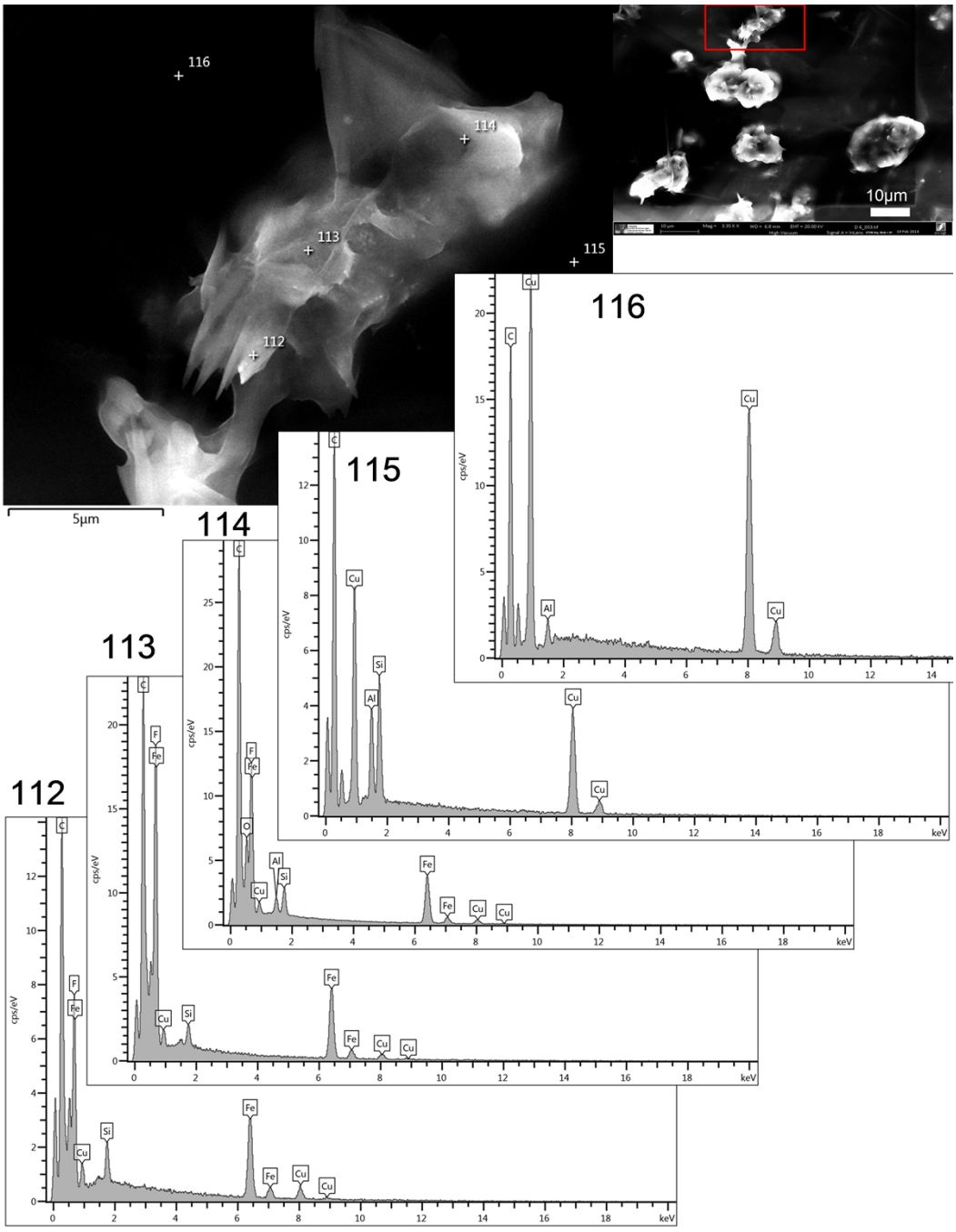

Figure S.9. Microelemental analysis for the SCO/D6 hybrid material. Inside the cluster (from 112 to 114 points) characteristics elements of the SCO material such as F and Fe are observed. Points 112 and 113 are located on the surface of around 8 µm fiber. Points 115 and 116 correspond with the background. Top right shows clusters formation around 10-20 µm. Large image is a red rectangle magnify.

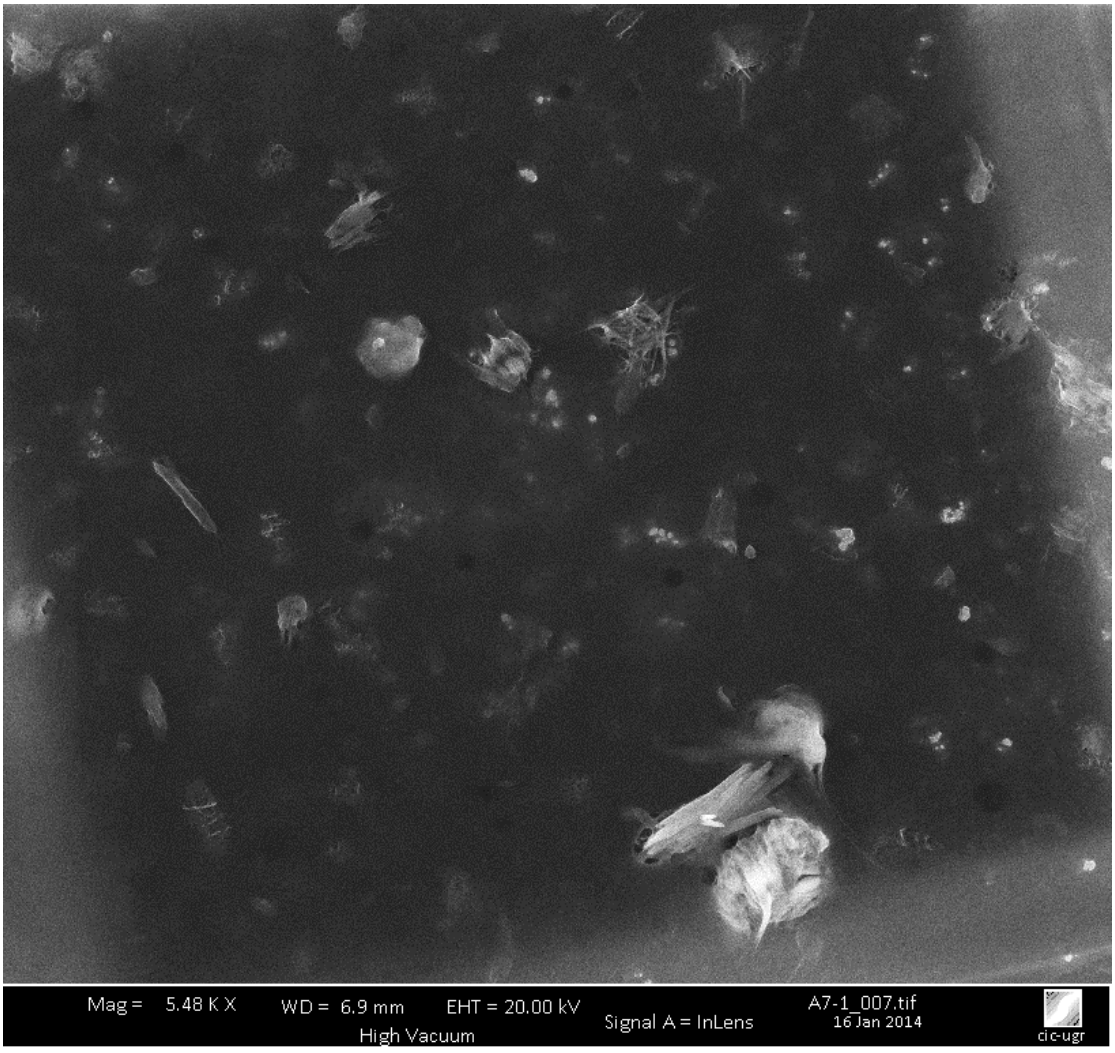

Figure S.10. Enlargement of the Figure 4.b for better visualization of the SCO particles in Nafion.

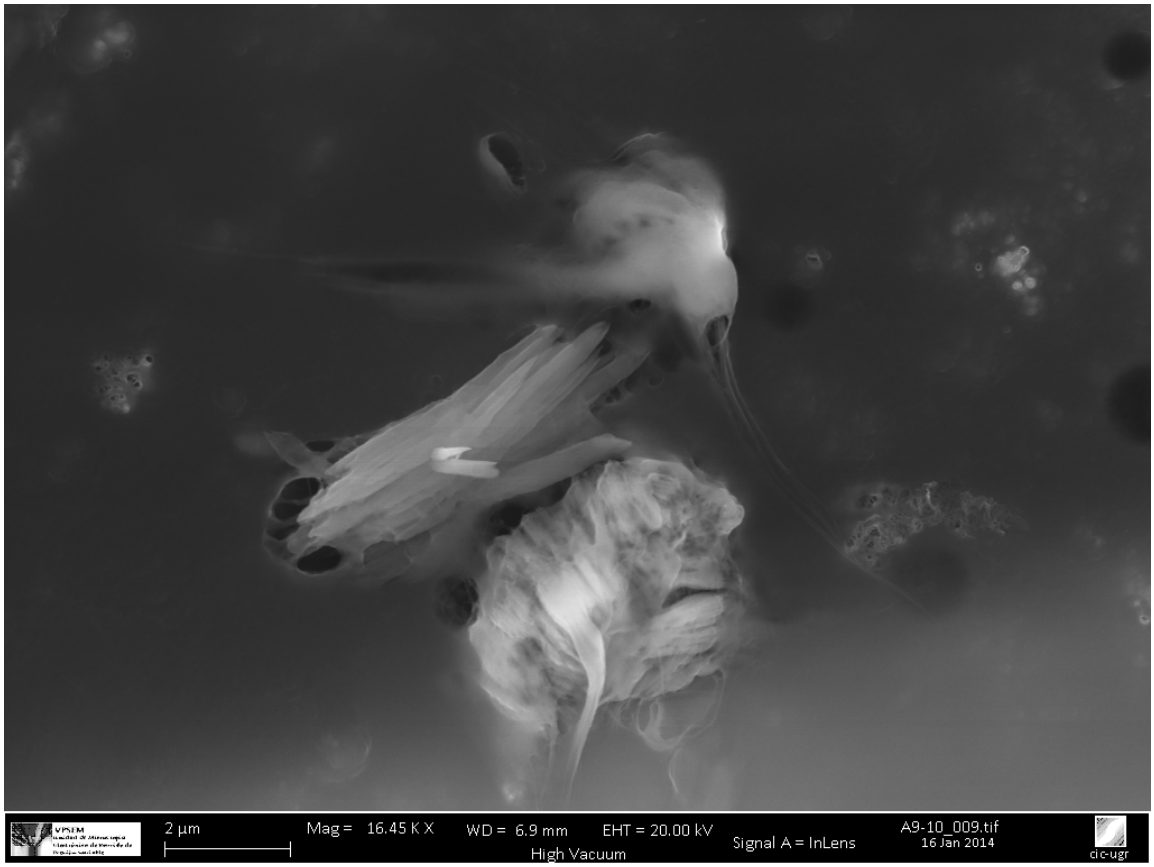

Figure S.11. Enlargement of the Figure 4.f for better visualization of the SCO particles in Nafion.

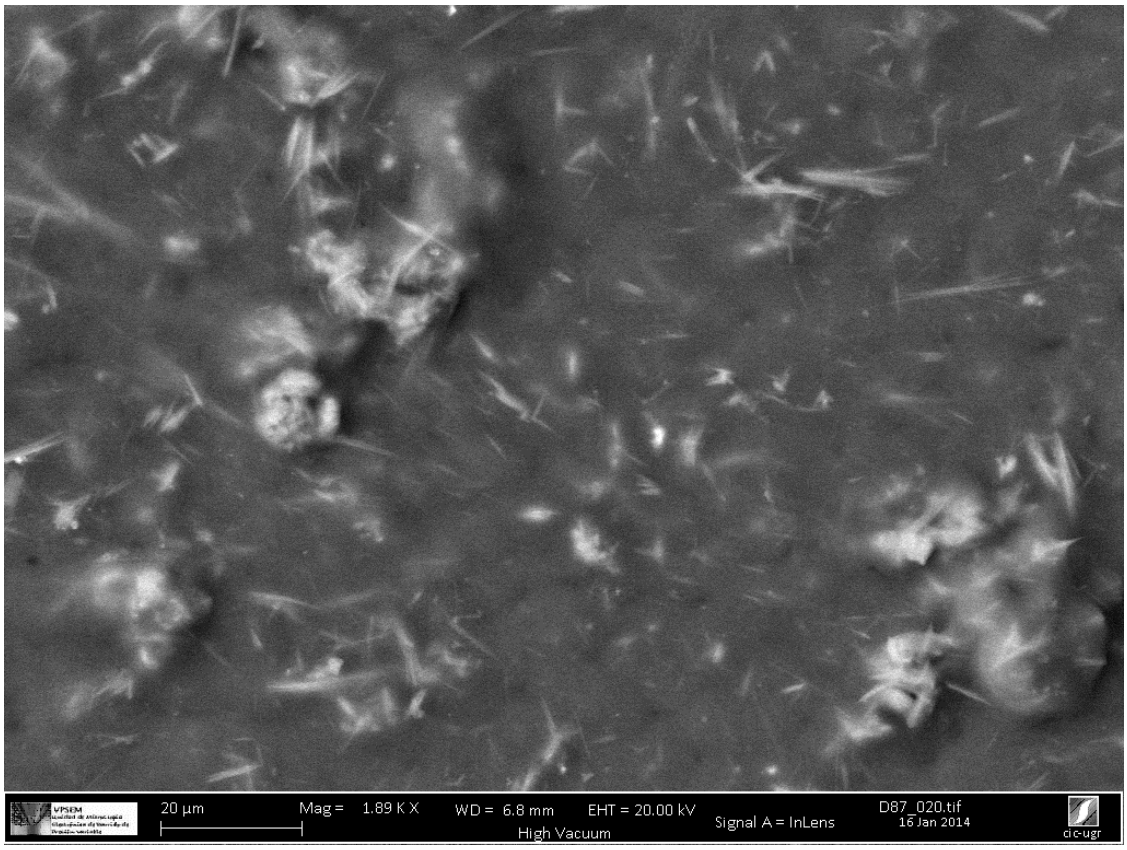

Figure S.12. Image at the top is an enlargement of the Figure 4.i for better visualization of the SCO particles forming fibers in D6. Fibers and larger clusters are observed.