

Supporting Information [Ref 19]

Bending test

Figure S1 shows the qualitative behavior of the test CE samples when bended to a semicircular geometry. The bending typically lasted for 20 seconds.

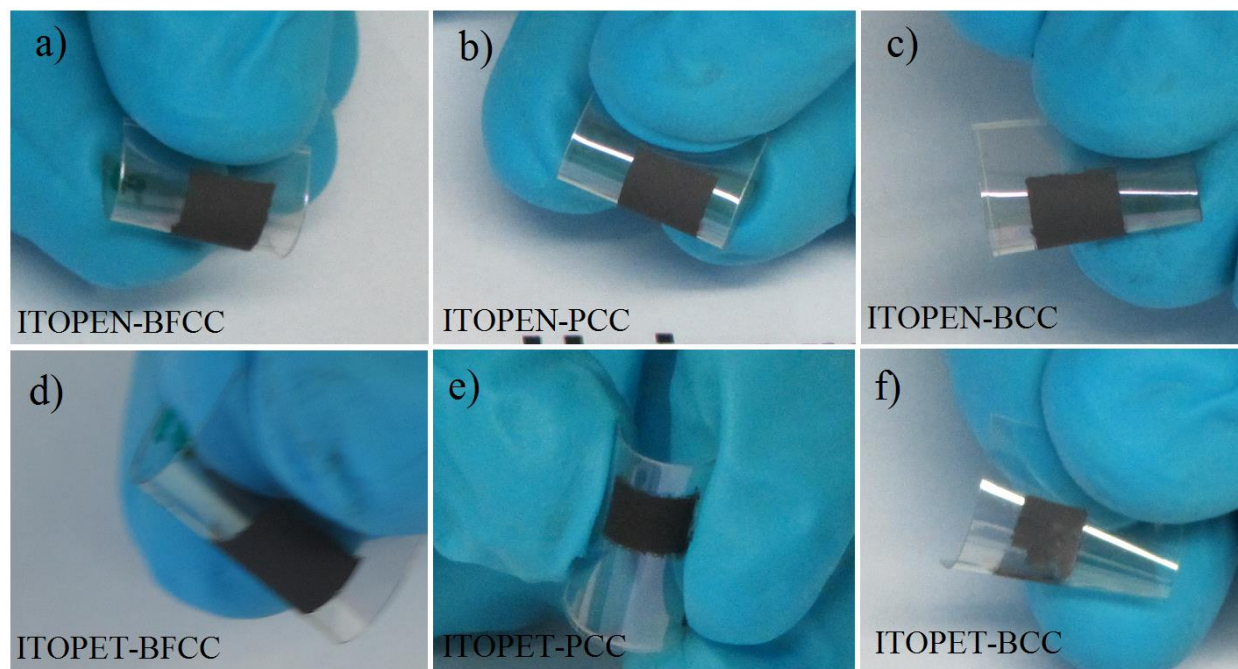


Figure S1: Bending test of carbon composites deposited on ITO-PEN and ITO-PET sheets

Description of Tape Adhesion Test

For the adhesion test the basic idea was adapted from the standardized tape tests ^{1, 2}. Carbon composites catalyst layers were first deposited on FTO-Glass, ITO-PEN and ITO-PET substrates by the doctor blading method. After that a stripe of adhesive tape (3M Scotch, Removable 811, 19 mm x 32.9 mm) was applied on each deposited layer and rolled with a heavy (650 g) round metallic disk (diameter = 70 mm) for four times to ensure the good adhesion of the tape with the catalyst layer. After that the tape was then pulled off from the substrate at 90° angle (Figure S2).

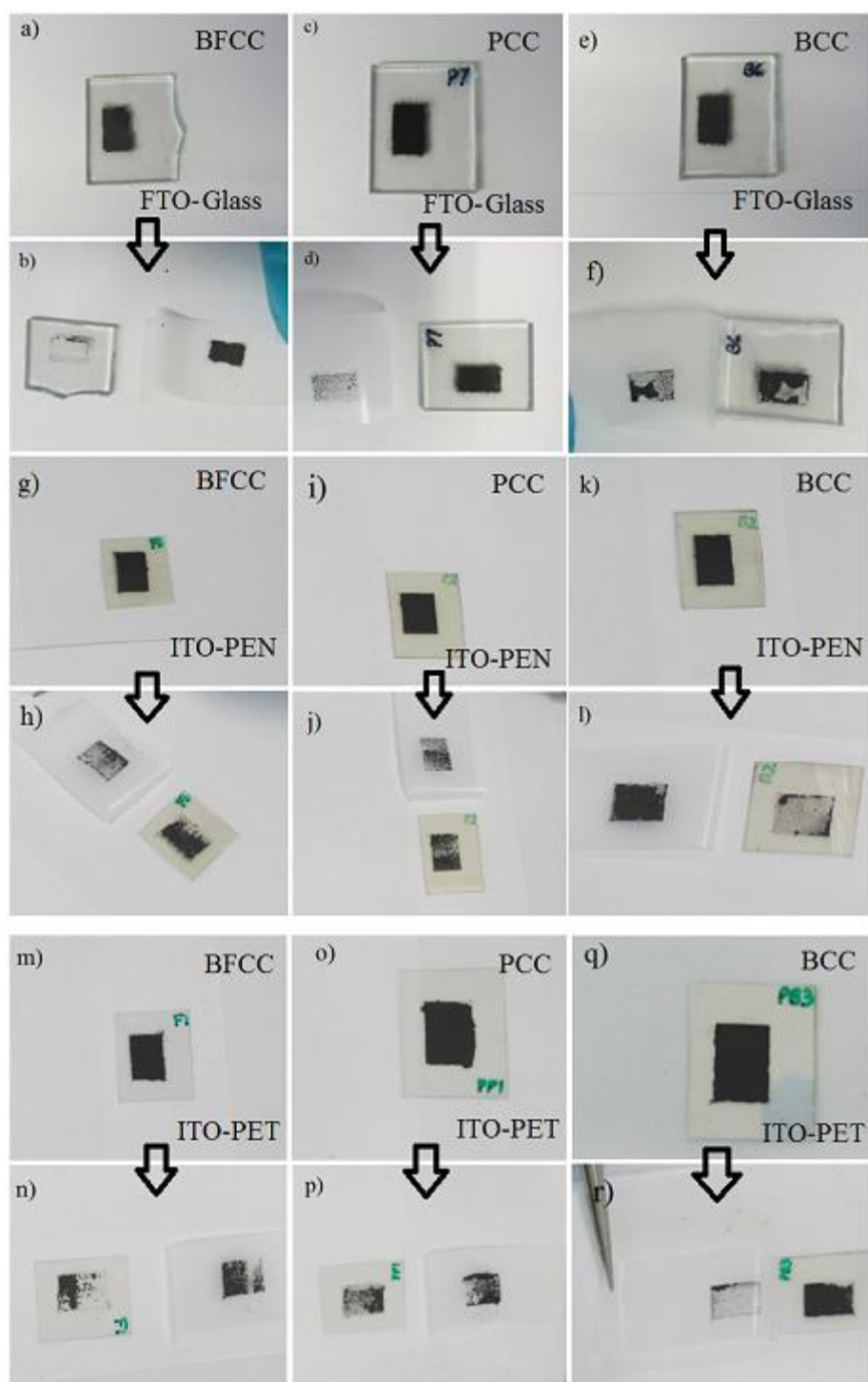
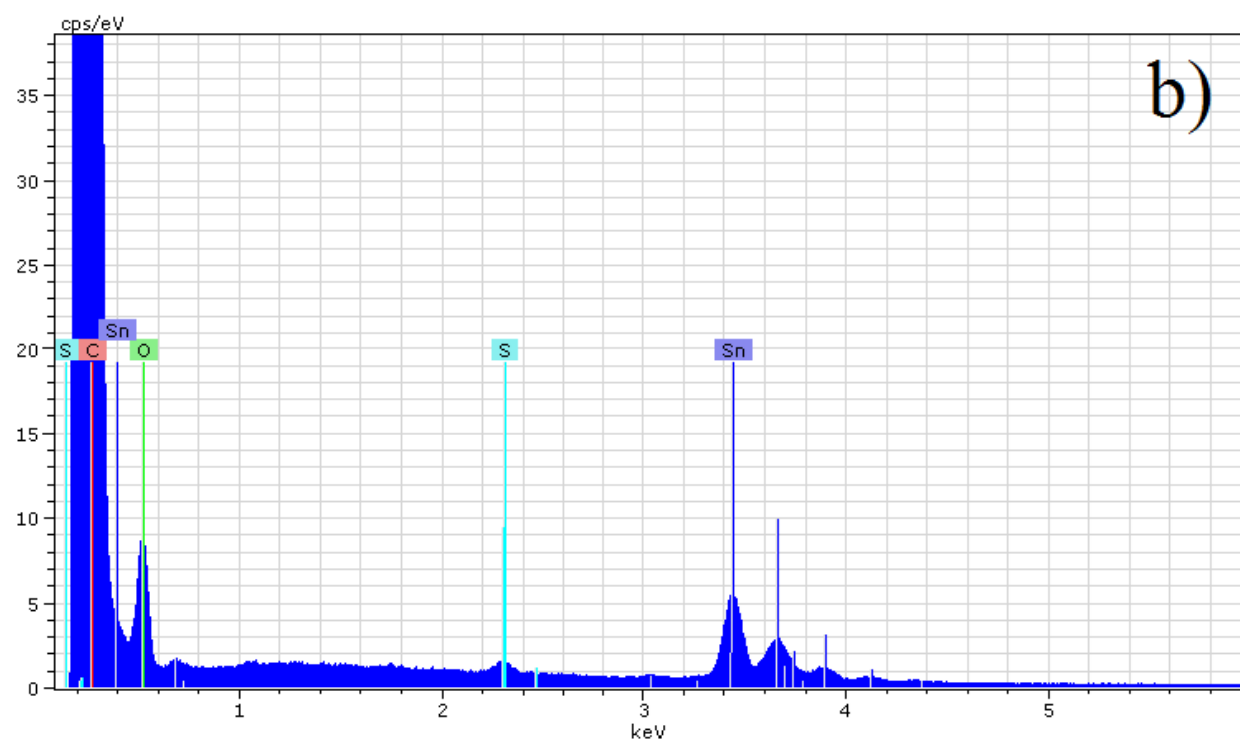
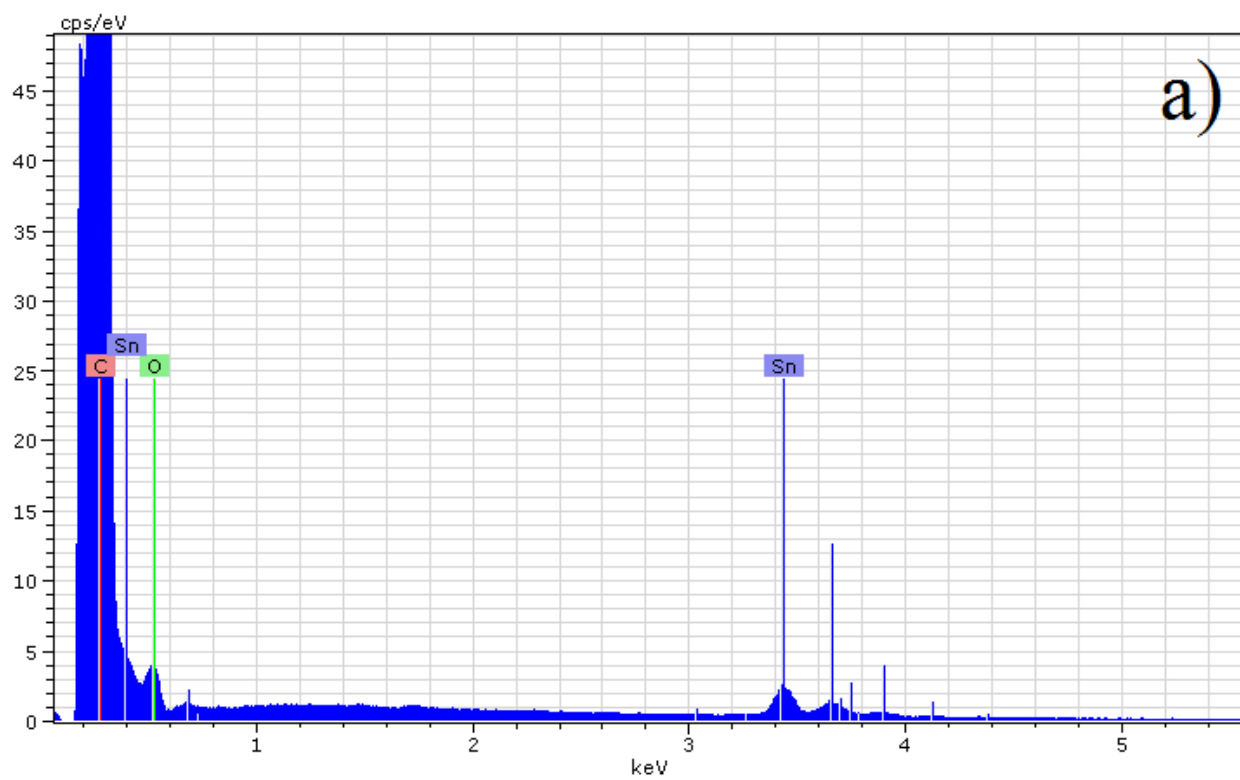


Figure S2: Tape adhesion test of carbon composites on FTO-Glass, ITO-PEN and ITO-PET sheets.



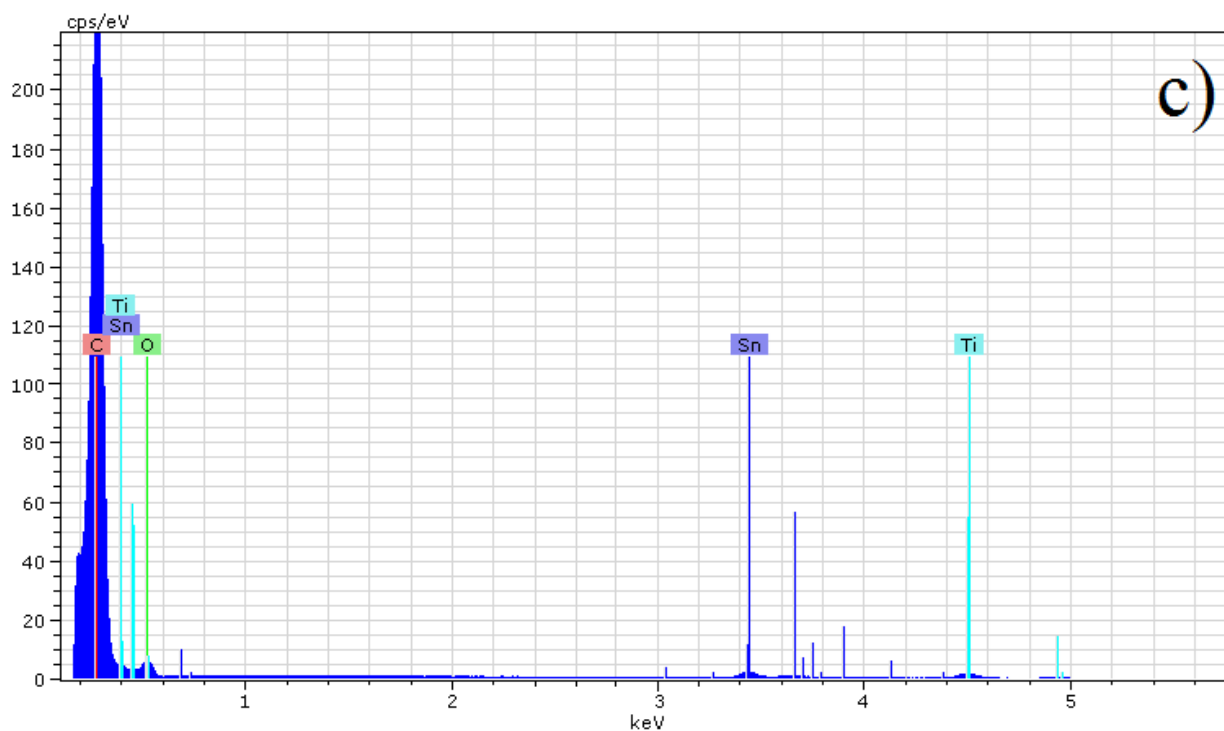


Figure S3: EDS spectra of a) Binder Free carbon composite (BFCC) b) PEDOT Carbon Composite (PCC) c) Binder enriched carbon composite (BCC).

EDS analysis

The EDS spectra confirms the presence of different materials in the different carbon composites as follows:

Binder Free carbon composite (BFCC) (Figure S3 a): SnO₂ (Sn and O peaks) and carbon (from graphite and furnace black).

PEDOT Carbon Composite (PCC) (Figure S3 b): Same materials as in BFCC, but added PEDOT that gives rise to the additional sulfur peak (S).

Binder enriched carbon composite (BCC) (Figure S3 c): Same materials as in BFCC, but added TiO₂ that gives rise to the additional Ti peak.

References

[1] <http://www.ipc.org/TM/2.4.1E.pdf>

[2] <http://www.pstc.org/files/public/101.pdf>