

Supporting Information

One step synthesis of highly ordered free standing flexible polypyrrole-silver nanocomposite films at air- water interface by photopolymerisation

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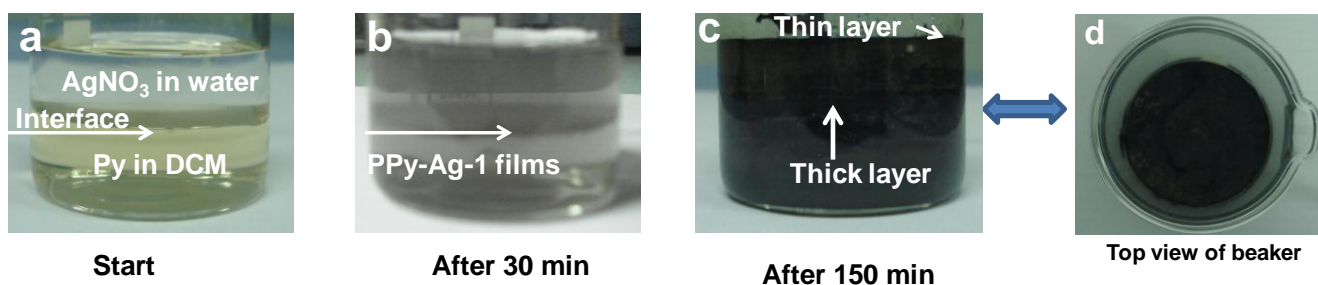


Figure S1: (a) The photograph showing the DCM-water interface at the start of the reaction (b) After 30 min of UV exposure. Photograph showing side view (c) and top view (d) of the beaker after UV exposure of 150 min.

Figure S1 shows the photograph of the samples at various stages of the preparation. The first image (Figure S1(a)) shows the clear interface between the DCM (containing Py monomers) and water (containing AgNO₃). After 30 minute of UV exposure the PPy-Ag films formation starts takes place (Figure S1(b)) at the DCM-Water interface. After UV exposure of 150 min, the image of the solution containing beaker is shown in Figure S1(c), the thick PPy-Ag layer formed at tha DCM-water (liquid-liquid) interface is clearly seen. The thin PPy-Ag layer formed at the air-water interface is seen in the top view of beaker shown in Figure S1(d).

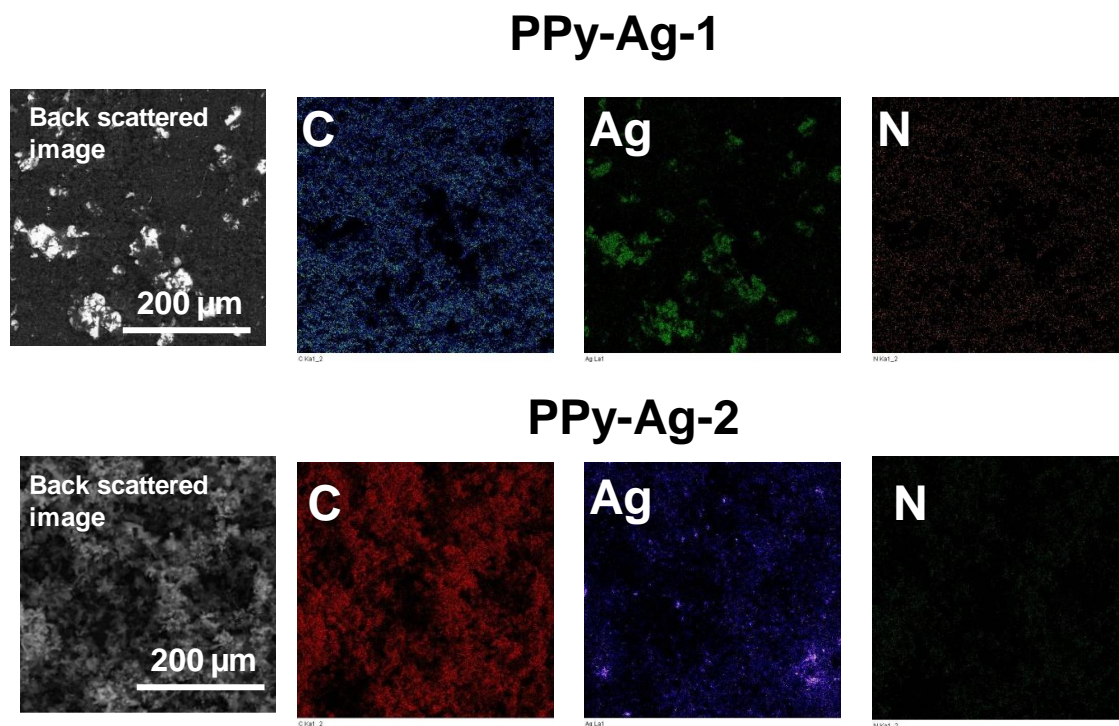


Figure S2: Back scattered electron images and elemental mapping of C, Ag and N in PPy-Ag-1 and PPy-Ag-2 films

Back scattered electron (BSE) images and elemental mapping of C, Ag and N in PPy-Ag-1 and PPy-Ag-2 films are shown in Figure S2. It may be noted that BSE images are very sensitive to the atomic numbers (Z) of the constituent elements present in the sample, high Z elements look brighter in the image. Comparing the BSE images and elemental mapping images of PPy-Ag-1 and PPy-Ag-2 films, the PPy-Ag-2 looks much more homogenous in terms of distribution of elements. In particular the distribution of Ag is much more inhomogeneous in PPy-Ag-1 films, the big ($\sim 50 \mu\text{m}$) and small size particles (nm size) can be seen. In case of PPy-Ag-2 films there is a uniform distribution of Ag nanoparticles.

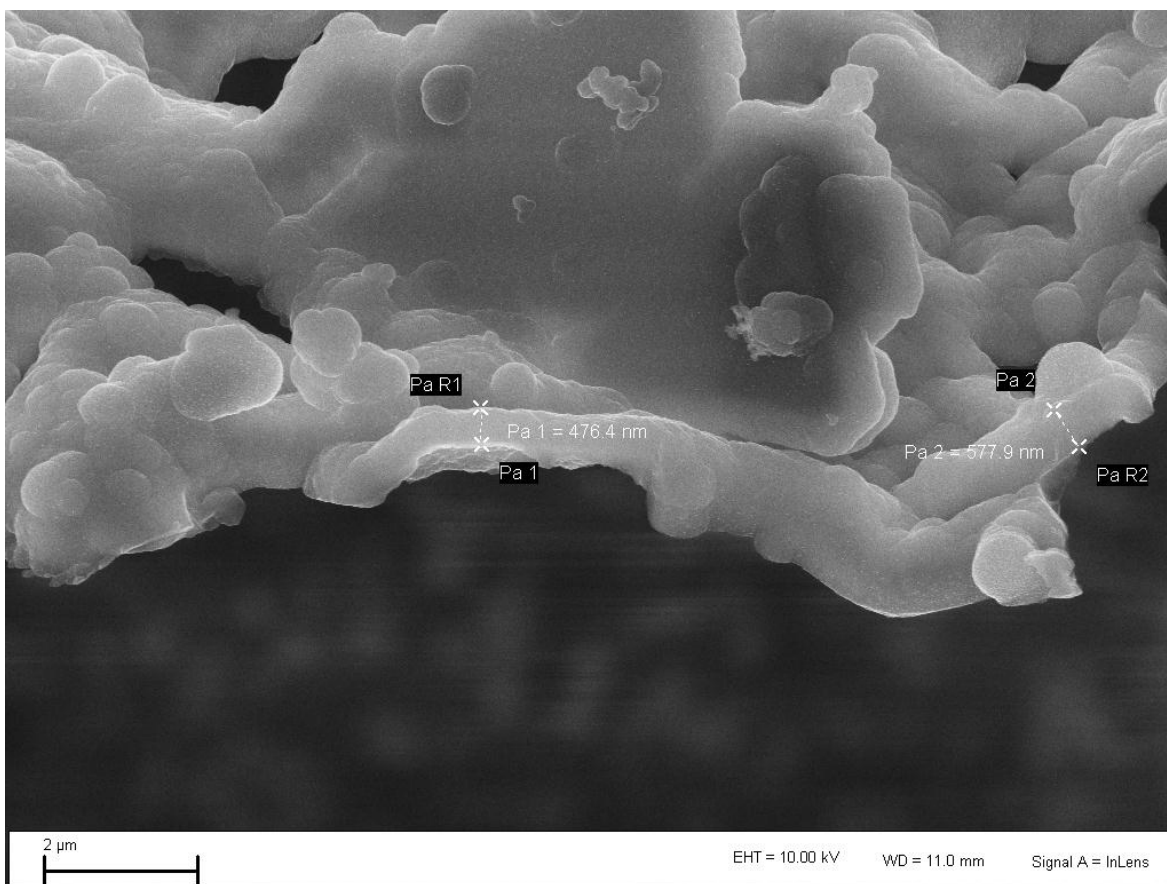


Figure S3: Scanning electron microscope (SEM) image of the PPy-Ag-2 films (for $\text{AgNO}_3 \sim 0.2 \text{ M}$) formed at air-water interface

The SEM image of the PPy-Ag-2 films (for $\text{AgNO}_3 \sim 0.2 \text{ M}$) formed at air-water interface is shown in Figure S3, which reveals a thickness of film $\sim 476 \text{ nm}$ along with the porosity in microstructure.