

Supplementary Information

A potentiostatic approach of growing polyaniline nanofiber in fractal morphology by interfacial electropolymerization

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Experimental Procedure: All experiments were done at room temperature. 0.01M monomer solution was made in organic phases which forms bottom layer in electrochemical cell. 0.5 M H₂SO₄ aqueous solution was used as top layer in the cell. 5ml. of H₂SO_{4(aq.)} solution was first poured in the cell then 5ml. of monomer was poured in H₂SO_{4(aq.)} solution by using micro syringe which is going directly to the bottom of aqueous phase very slowly so possibility of mixing of both phases is negligible. Care was taken to minimize any mixing of the two phases during addition. After adding both phases we wait for 15 min. to stabilize interface. No air bubble should be present at two phase interface. Three electrode system is used for polymerization and set in aqueous phase carefully. Working electrode is adjusted very close to organic/aqueous interface, just not touching the interface. So working electrode platinum foil dipped length is equal to the height of aqueous phase covered in cell. Platinum foil and Ag/AgCl (sat. KCl) were used as counter electrode (contains comparatively higher surface in solution) and reference electrode respectively. The cell and platinum foil working and counter electrodes were cleaned with freshly prepared chromic acid solution followed by ultrasonication in Milli-Q water prior to each experiment. 0.8V vs Ag/AgCl(sat. KCl) was applied by PINE bipotentiostat (Model AFCBP1) on working electrode for 5 min, 15 min. and 1 hour in different experiments. Potentiostatic polymerization ends with zero potential value. After polymerization experiment the excess of supporting electrolyte solution was soaked from working electrode with the help of filter paper and the working electrode was kept for drying at room temperature.

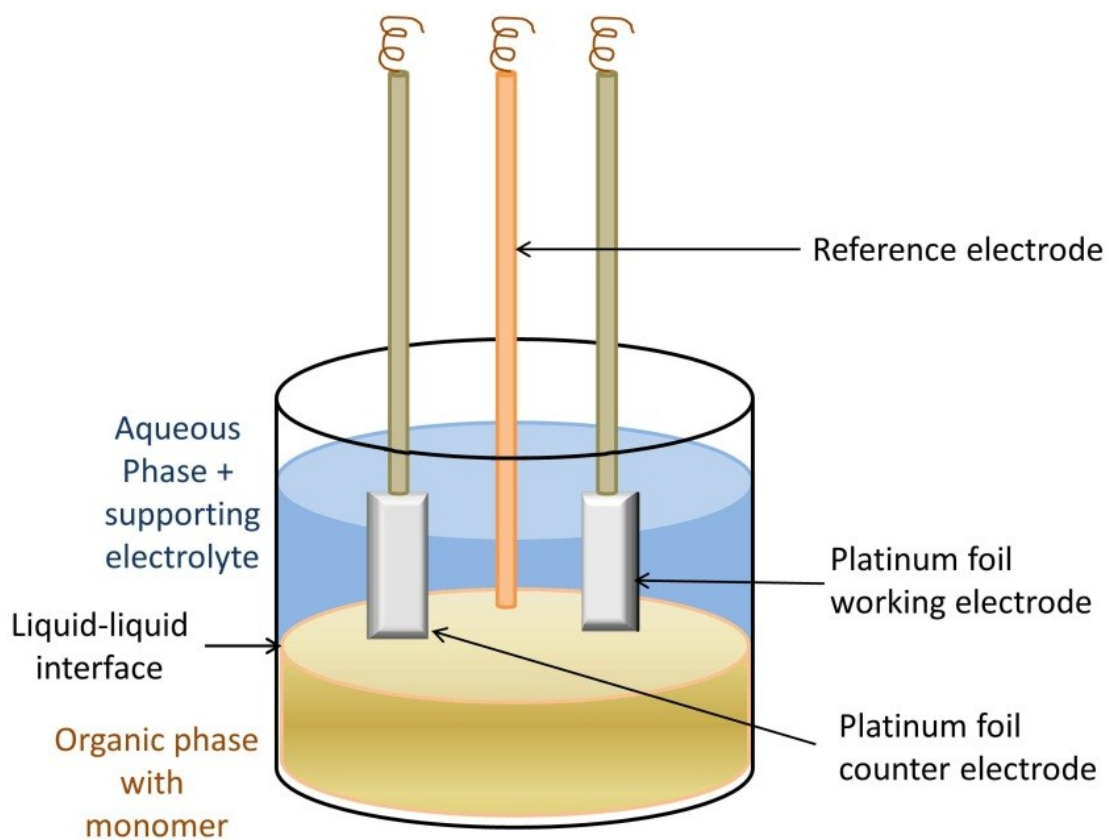


Fig. S1. Scheme of electrodes assembly: All three electrodes are in aqueous medium just close to liquid-liquid interface and monomer in organic medium.

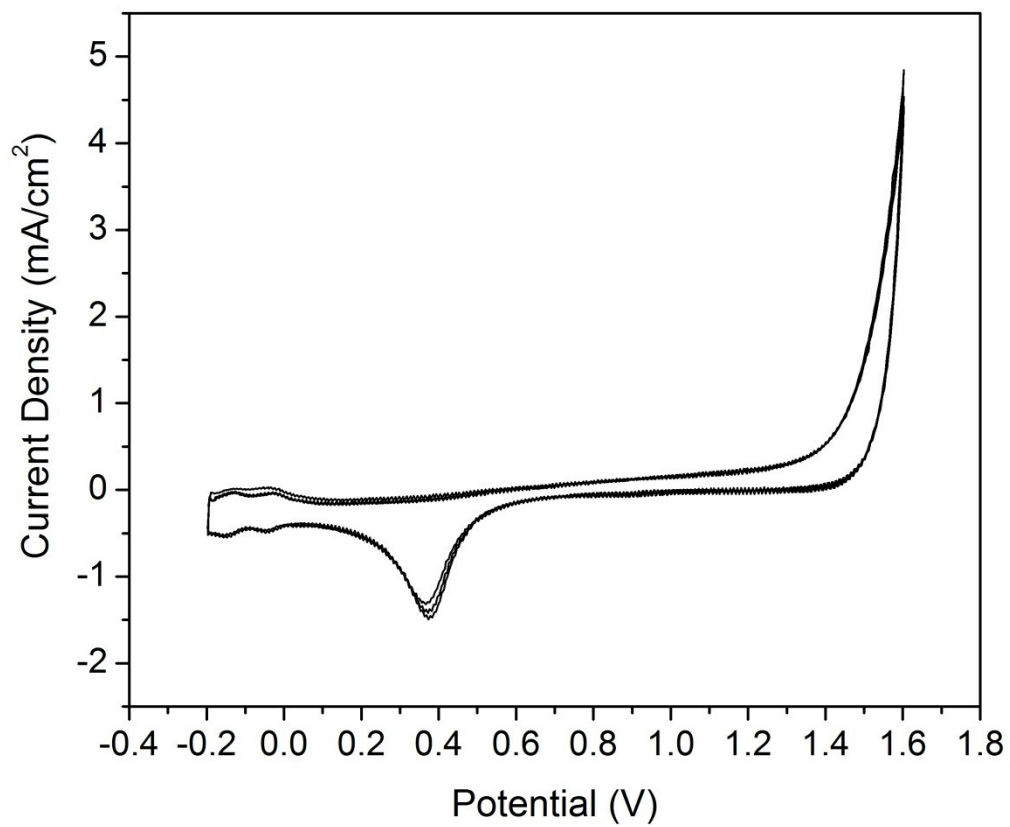


Fig. S2. Cyclic voltammogram (CV) of Platinum foil v/s Ag/AgCl (sat. KCl) in 0.5 M H₂SO₄.

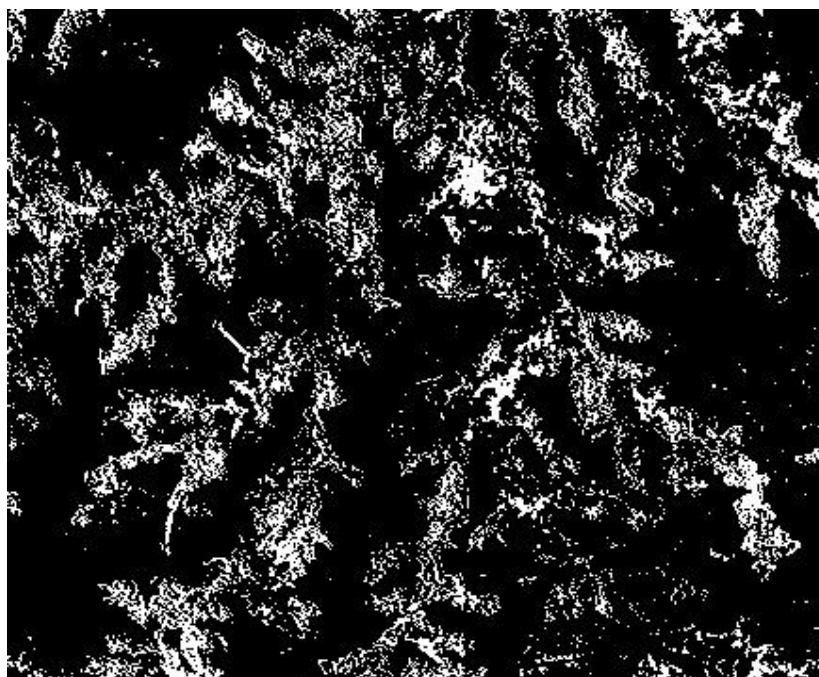
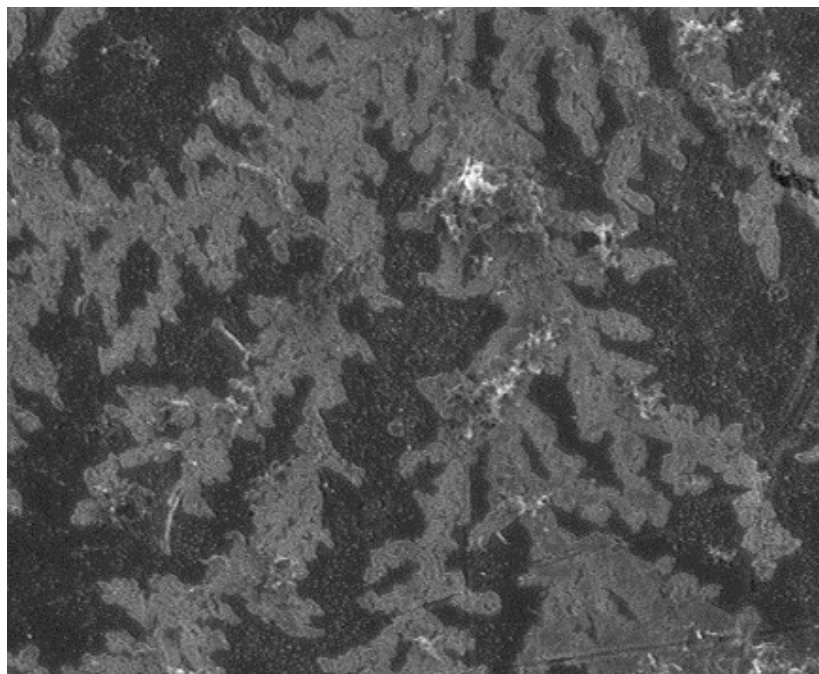


Fig S3. SEM image (polymerization time = 15 min., obtained in CCl_4 /aqueous system) thresholding gives black and white image in which white area is the area occupied by PANI fractal. Here calculated fractal Dimension = 1.61

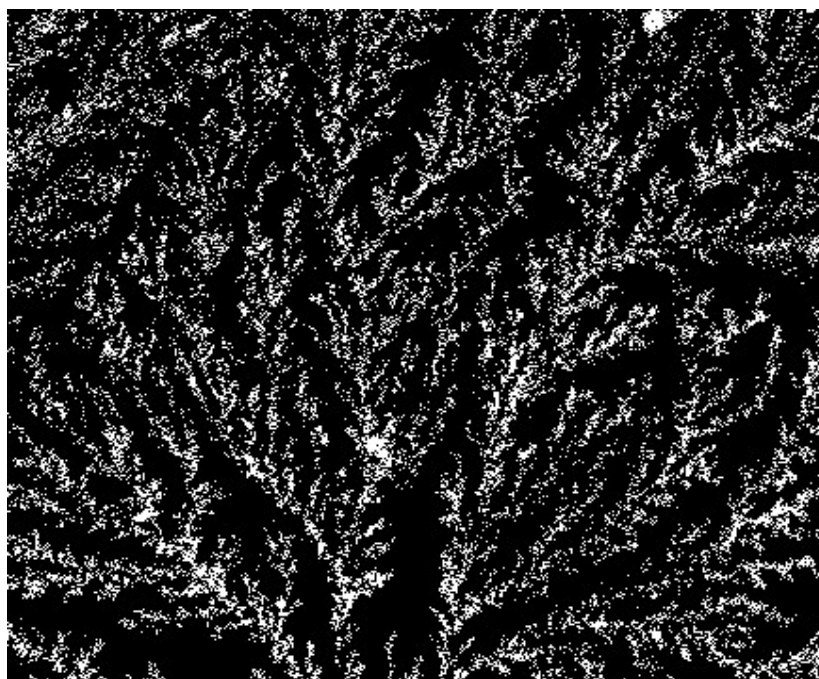
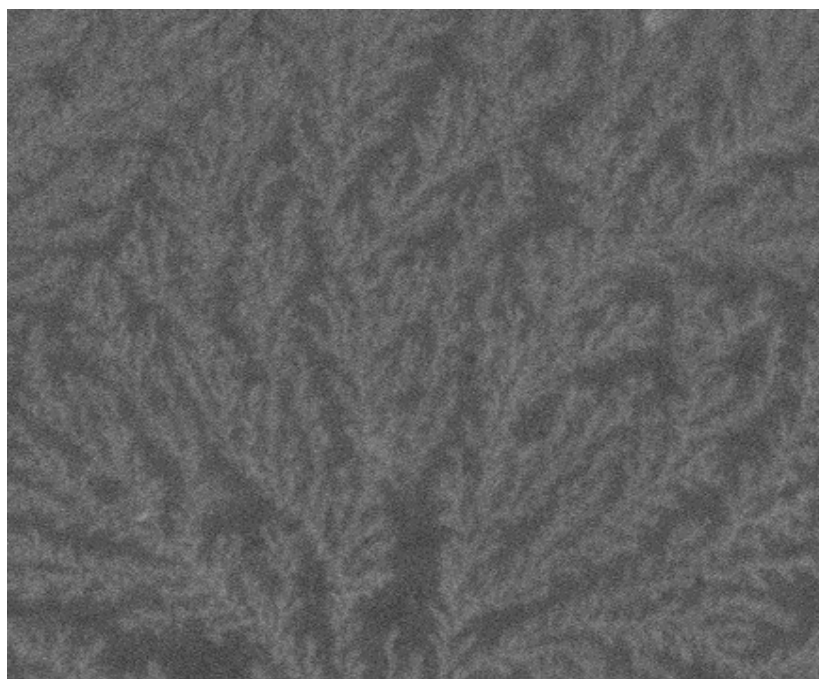


Fig S4. SEM image (polymerization time = 15 min., obtained in $\text{CHCl}_3/\text{water}$ system) thresholding gives black and white image in which white area is the area occupied by PANI fractal. Here calculated fractal Dimension = 1.69

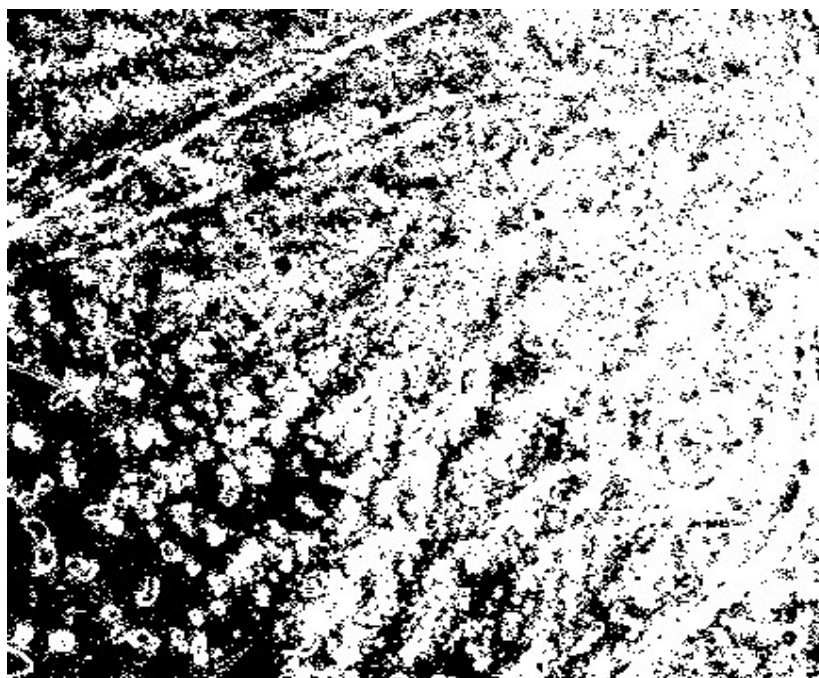
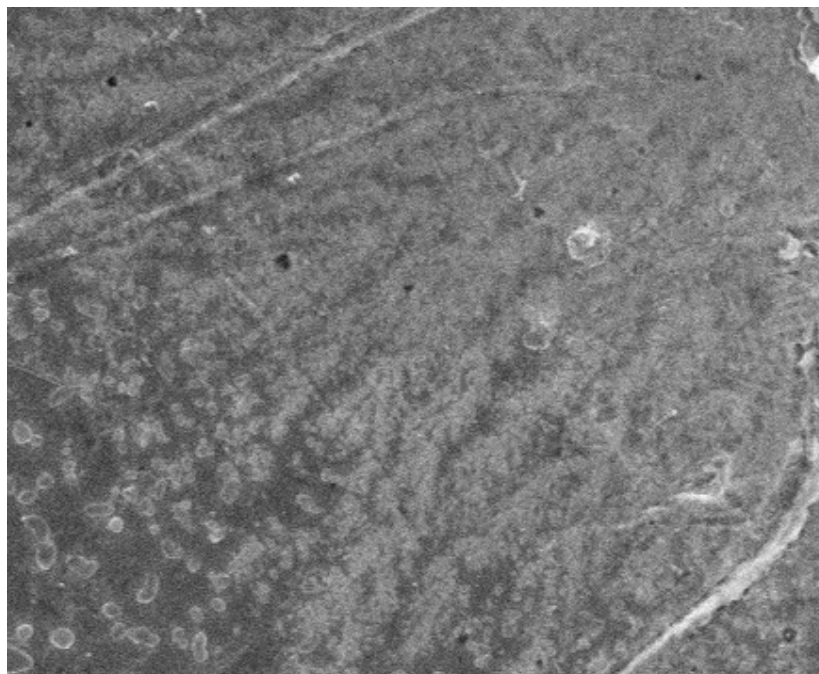


Fig S5. SEM image (polymerization time = 15 min., obtained in DCM/water system) thresholding gives black and white image in which white area is the area occupied by PANI fractal. Here calculated fractal Dimension = 1.81