Electronic Supplementary Information

PEDOT Nanostructures Synthesized in Hexagonal Mesophases

Srabanti Ghosh, Hynd Remita, Laurence Ramos, Alexandre Dazzi, Ariane Deniset-Besseau, Patricia Beaunier, Fabrice Goubard, Pierre-Henri Aubert, Francois Brisset and Samy Remita*

Laboratoire de Chimie Physique, UMR 8000-CNRS, Bât. 349, Université Paris-Sud, 91405 Orsay, France
Université Montpellier 2, Laboratoire Charles Coulomb UMR 5221, F-34095, Montpellier, France
CNRS, Laboratoire Charles Coulomb UMR 5221, F-34095, Montpellier, France
Laboratoire de Réactivité de Surface, UMR 7197-CNRS, UPMC, Université Paris 6, 75006 Paris, France
Laboratoire de Physicochimie des Polymères et Interfaces (LPPI), Université de Cergy-Pontoise, 95031 Cergy-Pontoise Cedex, France
ICMMO, UMR 8182-CNRS, Bât.410-420, Université Paris-Sud, 91405 Orsay, France
Département CASER, Ecole SITI, Conservatoire National des Arts et Métiers, CNAM, 292 rue Saint-Martin, 75141 Paris Cedex 03, France
*corresponding author, e-mail: samy.remita@u-psud.fr

List of contents:

Figure S1- Photographs of (a) hexagonal mesophases in the presence of 0.1 M EDOT and in the absence of FeCl₃ (b) mesophases doped with chemical oxidant FeCl₃ at 0.1 M in the absence of EDOT and (c) hexagonal liquid crystals prepared in the presence of both EDOT and FeCl₃. The color change indicates the oxidation of EDOT monomers by FeCl₃.

Figure S2- Absorption spectrum of ethanolic solution containing 0.1 M in FeCl₃ used as chemical oxidant for the oxidation of EDOT monomers. The optical path length was 0.1 cm. The reference was ethanol.
**Figure S3**- Cryo-TEM images of hexagonal mesophases in the absence (a) or in the presence (b) of both 0.1 M EDOT and 0.1 M FeCl₃.

**Figure S4**- Optical images of PEDOT polymers deposited on ZnSe prism after extraction from hexagonal mesophases. For PEDOT synthesis, 0.1 M in EDOT and 0.1 M in FeCl₃ were used at 0.1 M in NaCl (a) or 0.3 M in NaCl (b).

**Figure S5**- TEM image of PEDOT polymers synthesized in bulk solution (without using the swollen hexagonal mesophases). 0.1 M in EDOT and 0.1 M in FeCl₃ were used for PEDOT preparation.

**Figure S6**- TEM image of PEDOT polymers first synthesized in bulk solution using 0.1 M in EDOT and 0.1 M in FeCl₃, then incorporated in mesophases and finally extracted from these latter thanks to our optimized extraction procedure.
Figure S1 - Photographs of (a) hexagonal mesophases in the presence of 0.1 M EDOT and in the absence of FeCl₃ (b) mesophases doped with chemical oxidant FeCl₃ at 0.1 M in the absence of EDOT and (c) hexagonal liquid crystals prepared in the presence of both EDOT and FeCl₃. The color change indicates the oxidation of EDOT monomers by FeCl₃.
**Figure S2**

*Absorption spectrum of ethanolic solution containing 0.1 M in FeCl₃ used as chemical oxidant for the oxidation of EDOT monomers. The optical path length was 0.1 cm. The reference was ethanol.*
Figure S3 - Cryo-TEM images of hexagonal mesophases in the absence (a) and in the presence (b) of both 0.1 M EDOT and 0.1 M FeCl₃.
Figure S4

Optical images of PEDOT polymers deposited on ZnSe prism after extraction from hexagonal mesophases. For PEDOT synthesis, 0.1 M in EDOT and 0.1 M in FeCl$_3$ were used at 0.1 M in NaCl (a) or 0.3 M in NaCl (b).
**Figure S5**

**Figure S5-** TEM image of PEDOT polymers synthesized in bulk solution (without using the swollen hexagonal mesophases). 0.1 M in EDOT and 0.1 M in FeCl₃ were used for PEDOT preparation.
Figure S6- TEM image of PEDOT polymers first synthesized in bulk solution using 0.1 M in EDOT and 0.1 M in FeCl₃, then incorporated in mesophases and finally extracted from these latter thanks to our optimized extraction procedure.