*Supplementary Information for:*

Synthesis and characterization of emeraldine salt (PANI-ES) colloids using potato starch as stabilizer, to enhance physicochemical properties and processibility.

Soufiane Boudjelida, Xue Li, Souad Djellali, Giampiero Chiappetta, Francesca Russo, Alberto Figoli, Mauro Carraro

***Solubility data***

Table S1: Solubility of PANI-ES/Starch composites

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T°C** | **ES-Starch**  **(W% w%)** | **Acetone** | **Methanol** | **Ethanol** | **Glycerol** | **Ethyle Acetate** | **Chloroform** | **Toluene** | **Hexane** | **Cyclohexane** | **DMSO** | **Water** | **DMF** | **NMP** |
| **20** | Z11 | Δ | Δ | Δ | Δ | Δ | Δ | Δ | Δ | Δ | O | Δ | X | O |
| Z21 | Δ | Δ | Δ | Δ | Δ | Δ | Δ | Δ | Δ | O | Δ | X | O |
| Z31 | Δ | Δ | Δ | Δ | Δ | Δ | Δ | Δ | Δ | O | Δ | X | O |
| PANI ES | Δ | Δ | Δ | Δ | Δ | Δ | Δ | Δ | Δ | O | Δ | X | O |
| Starch | Δ | Δ | Δ | Δ | Δ | Δ | Δ | Δ | Δ | X | O | O | X |
| **40** | Z11 | Δ | Δ | Δ | Δ | Δ | Δ | Δ | Δ | Δ | O | Δ | X | O |
| Z21 | Δ | Δ | Δ | Δ | Δ | Δ | Δ | Δ | Δ | O | Δ | X | O |
| Z31 | Δ | Δ | Δ | Δ | Δ | Δ | Δ | Δ | Δ | O | Δ | X | O |
| PANI ES | Δ | Δ | Δ | Δ | Δ | Δ | Δ | Δ | Δ | O | Δ | X | O |
| Starch | Δ | Δ | Δ | Δ | Δ | Δ | Δ | Δ | Δ | X | O | O | X |
| **60** | Z11 | - | Δ | Δ | O | Δ | O | Δ | Δ | Δ | X | Δ | X | X |
| Z21 | - | Δ | Δ | O | Δ | O | Δ | Δ | Δ | X | Δ | X | X |
| Z31 | - | Δ | Δ | O | Δ | O | Δ | Δ | Δ | X | Δ | X | X |
| PANI ES | - | Δ | Δ | Δ | Δ | Δ | Δ | Δ | Δ | X | Δ | X | X |
| Starch | - | Δ | Δ | Δ | Δ | Δ | Δ | Δ | Δ | X | O | O | X |
| **80** | Z11 | - | - | - | O | Δ | - | Δ | Δ | Δ | X | Δ | X | X |
| Z21 | - | - | - | O | Δ | - | Δ | Δ | Δ | X | Δ | X | X |
| Z31 | - | - | - | O | Δ | - | Δ | Δ | Δ | X | Δ | X | X |
| PANI ES | - | - | - | Δ | Δ | - | Δ | Δ | Δ | X | Δ | X | X |
| Starch | - | - | - | Δ | Δ | - | Δ | Δ | Δ | X | O | O | X |

Symbols: Δ: not soluble, O: slightly soluble, X: soluble, -: evaporation of the solvents

***Cyclic voltammetry***

|  |  |
| --- | --- |
|  |  |
| PANI ES | Z11 |
|  |  |
| Z21 | Z31 |

**Figure S1.** Cyclic voltammograms of PANI and PANI/starch biocomposites.

**Table S2**. Redox parameters from cyclic voltammogram peaks of PANI and PANI/starch biocomposites.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Products** | **Scan rate**  **mV/sec** | **OX 1** | **OX 2** | **Red 1** | **Red 2** |
| Z11 | 10 | 0.71 | 2.1 | -0,71 | -0.57 |
| 50 | 4.7 | 13.74 | -6.43 | -1.8 |
| 100 | 6.8 | 11.75 | -6.77 | -1.8 |
| Z21 | 10 | 1.1 | 0.46 | -0.17 | -0.31 |
| 50 | 3.03 | 1.38 | -0.41 | -0.6 |
| 100 | 3.63 | 2.41 | -0.69 | -0.77 |
| Z31 | 10 | 0.71 | 0.36 | -0.09 | -0.38 |
| 50 | 2.08 | 1.28 | -0.31 | -0.6 |
| 100 | 2.30 | 1.47 | -0.47 | -0.64 |
| PANI ES | 10 | 0.99 | 0.26 | -0.08 | -0.2 |
| 50 | 2.93 | 0.88 | -0.22 | -0.47 |
| 100 | 4.11 | 1.5 | -0.37 | -0.69 |