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**"Understanding the charge storage mechanism of conductive polymers as hybrid battery-capacitor material in ionic liquids by in-situ atomic force microscopy and electrochemical quartz crystal microbalance" Journal of Materials Chemistry A, 2018, DOI: 10.1039/C8TA06757K**

**Data Description**

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| --- | --- | --- |
| File Name | Description | Related Figure in Manuscript |
| EQCM\_Quartz\_Argon | Settling time quartz for determination resonance frequency of the quartz *f0* | - |
| EQCM\_Polymerisation | Polymerisation of EDOT on quartz in Lewis neutral EMImCl-AlCl3 + 0.1 mol dm-3 EDOT | Figure 3 A |
| EQCM\_Polymerisation\_Fit | Polymerisation of EDOT on quartz in Lewis neutral EMImCl-AlCl3 + 0.1 mol dm-3 EDOT, calculated parameters with algorithm ( see supplementary material) | Figure 3 B, C and D |
| EQCM\_Cycling | Cycling of PEDOT on quartz in monomer-free Lewis neutral EMImCl-AlCl3 | Figure 4 A and Figure 5 |
| EQCM\_Cycling\_Fit | Cycling of PEDOT on quartz in monomer-free Lewis neutral EMImCl-AlCl3, calculated parameters with algorithm ( see supplementary material) | Figure 4 B, C and D and Figure 5 |
| Cycling\_10mVs-1 | CV with 10 mV s-1 PEDOT in in monomer-free Lewis neutral EMImCl-AlCl3 | Figure 6 |
| Cycling\_50mVs-1 | CV with 50 mV s-1 PEDOT in in monomer-free Lewis neutral EMImCl-AlCl3 | Figure 6 |
| Cycling\_100mVs-1 | CV with 100 mV s-1 PEDOT in in monomer-free Lewis neutral EMImCl-AlCl3 | Figure 6 |
| Cycling\_200mVs-1 | CV with 200 mV s-1 PEDOT in in monomer-free Lewis neutral EMImCl-AlCl3 | Figure 6 |

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