Supplementary Material

Effects of Carbon Pore Size on the Contribution of Ionic Liquid Electrolyte Phase Transitions to Energy Storage in Supercapacitors

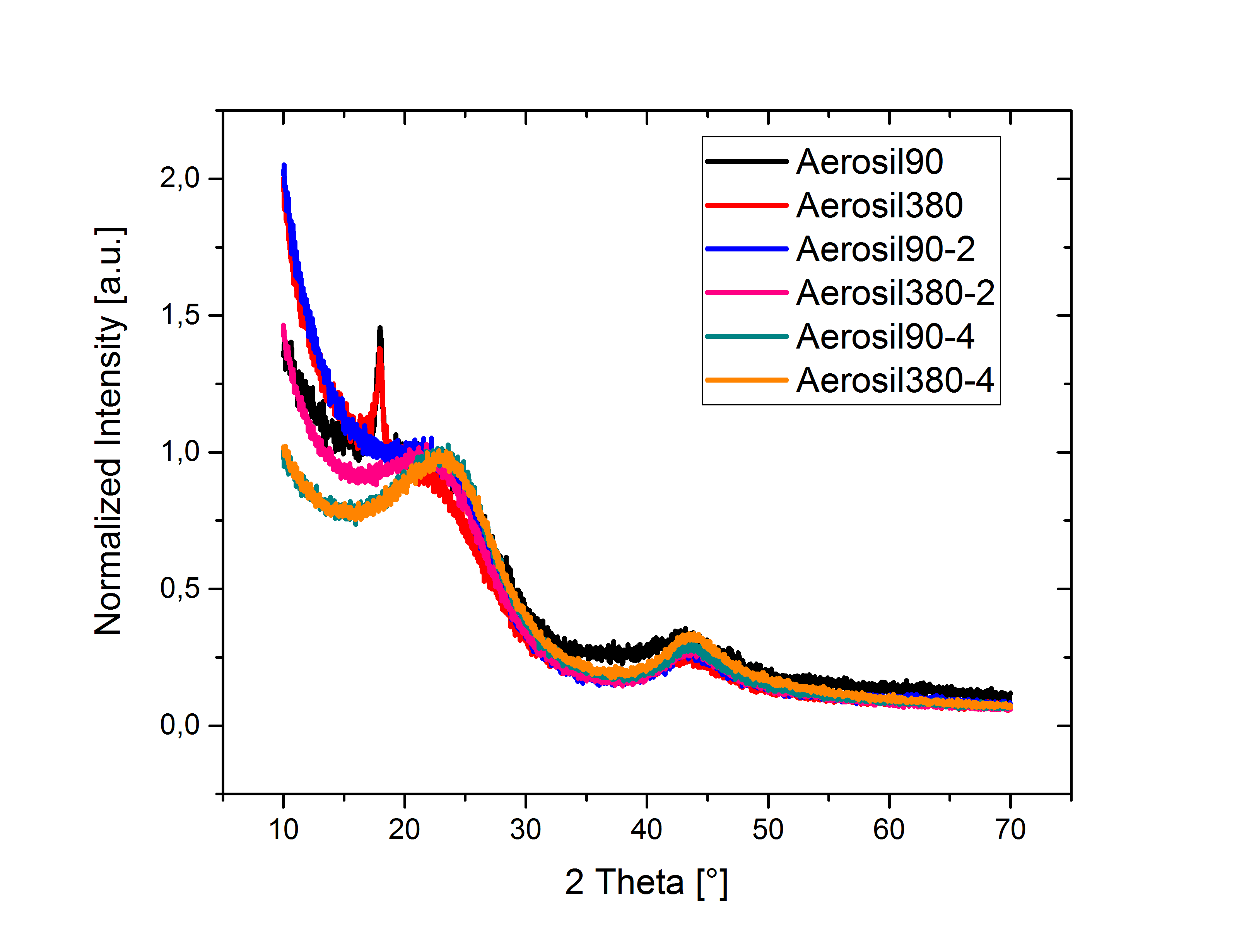
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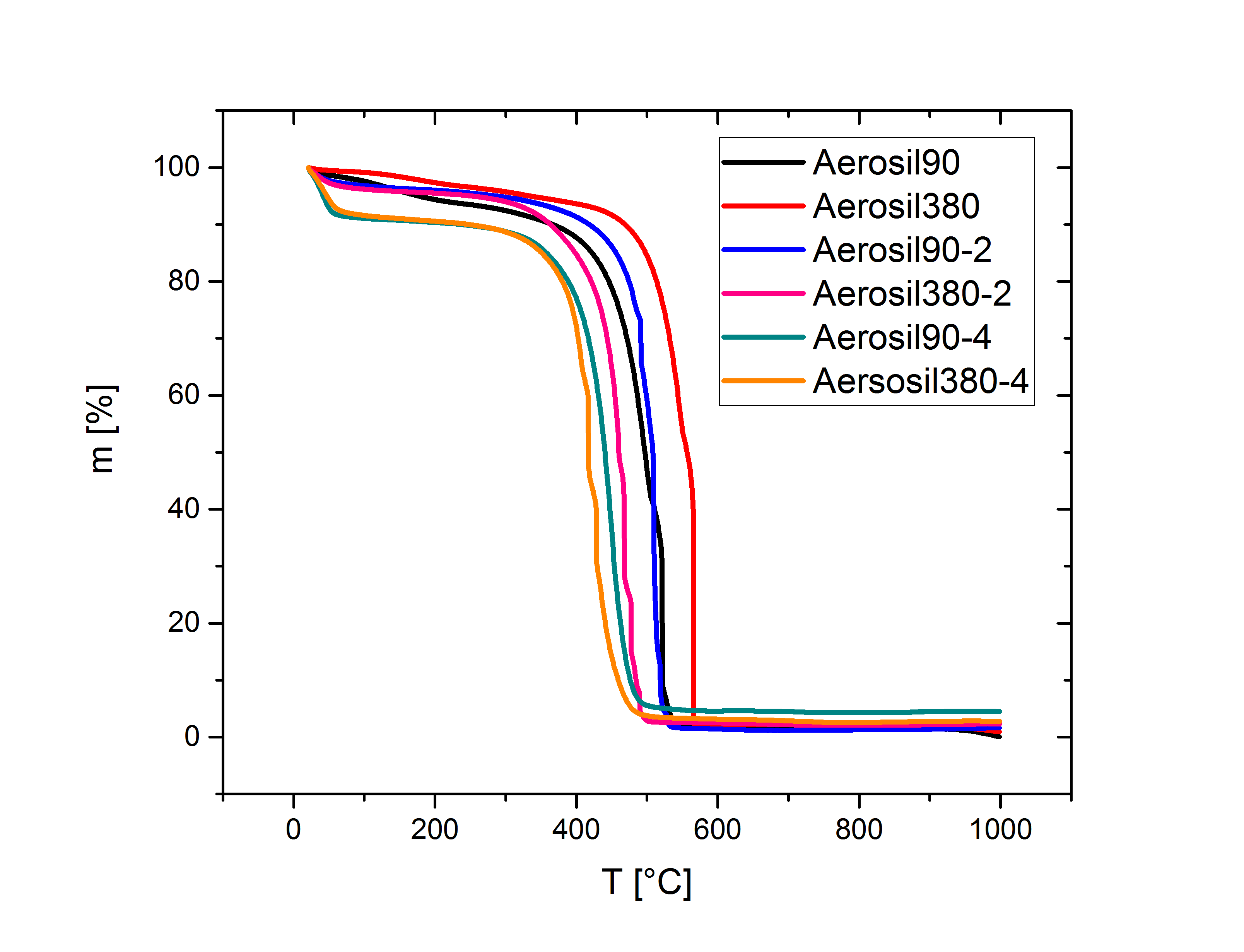
# Supplementary Figures

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**Figure S1: Schematic cut through the employed custom-built three-electrode cell.**



**Figure S2**: X-ray diffraction patterns of the synthesized carbon materials.



**Figure S3**: Thermogravimetric analysis of the synthesized carbon materials (synthetic air flow, 5 K min-1).

**Table S1**: Elemental analysis of the synthesized carbons.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Carbon | N [wt%] | C [wt%] | H [wt%] | S [wt%] |
| Aerosil90-1 | 0.33 | 84.62 | 1.849 | 0.996 |
| Aerosil90-2 | 0.18 | 90.53 | 1.271 | 0.895 |
| Aerosil90-4 | 0.18 | 88.55 | 1.285 | 0.800 |
| Aerosil380-1 | 0.25 | 84.15 | 1.248 | 0.818 |
| Aerosil380-2 | 0.16 | 88.81 | 1.198 | 0.759 |
| Aerosil380-4 | 0.18 | 88.54 | 1.177 | 0.757 |

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| S4c\\HOME\schutjajew$\My Documents\2_PhD\Frontiers 2018\Raman\raman_90-4.tif | S4d\\HOME\schutjajew$\My Documents\2_PhD\Frontiers 2018\Raman\raman_380-1.tif |
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**Figure S4**: Raman spectra and the corresponding fitting curves of the synthesized carbons.

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| S5a Aerosil‑1 | S5b Aerosil‑2 | S5c Aerosil‑4 |

**Figure S5**: Comparison of cyclic voltammograms of Aerosil® templated carbons in EMImBF4 depending on pore sizes and pore volumes (0 - 5.0 V, ν = 2 mV s-1).

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| S6a Aerosil‑1 | S6b Aerosil‑2 | S6c Aerosil‑4 |

**Figure S6**: Comparison of cyclic voltammograms of Aerosil® templated carbons in BMImBF4 depending on pore sizes and pore volumes (0 5.0 V, ν = 2 mV s-1).

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| S7a 2 mV s-1 | S7b 5 mV s-1 | S7c 10 mV s-1 |
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| S7d 2 mV s-1 | S7e 5 mV s-1 | S7f 10 mV s-1 |

**Figure S7**: Comparison of cyclic voltammograms of Aerosil380‑1 in EMImBF4 depending on scanrate (0 - 5.0 V). (a)-(c) two-electrode-, (d)-(f) three-electrode setup.

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**Figure S8**:Result of CV measurement of Aerosil380‑1 in EMImBF4, if the working electrode is negatively polarized in the first scan.

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**Figure S9**: Cyclic voltammograms of Aerosil380-1, -2, and-4 with purified EMImBF4 as the electrolyte in three-electrode setup. Inset shows magnification of the measurement of Aerosil380-4.