Elettronic Supplementary Information for:

Salt-confinement enables production of nitrogen-doped porous carbons in an air oven

Martina Ambrogi, Yongjun Men, Frank Polzer, Jiayin Yuan*

Max Planck Institute of Colloids and Interfaces, Department of Colloid Chemistry, Research Campus Golm, D-14424 Potsdam, Germany. E-mail: jiayin.yuan@mpikg.mpg.de

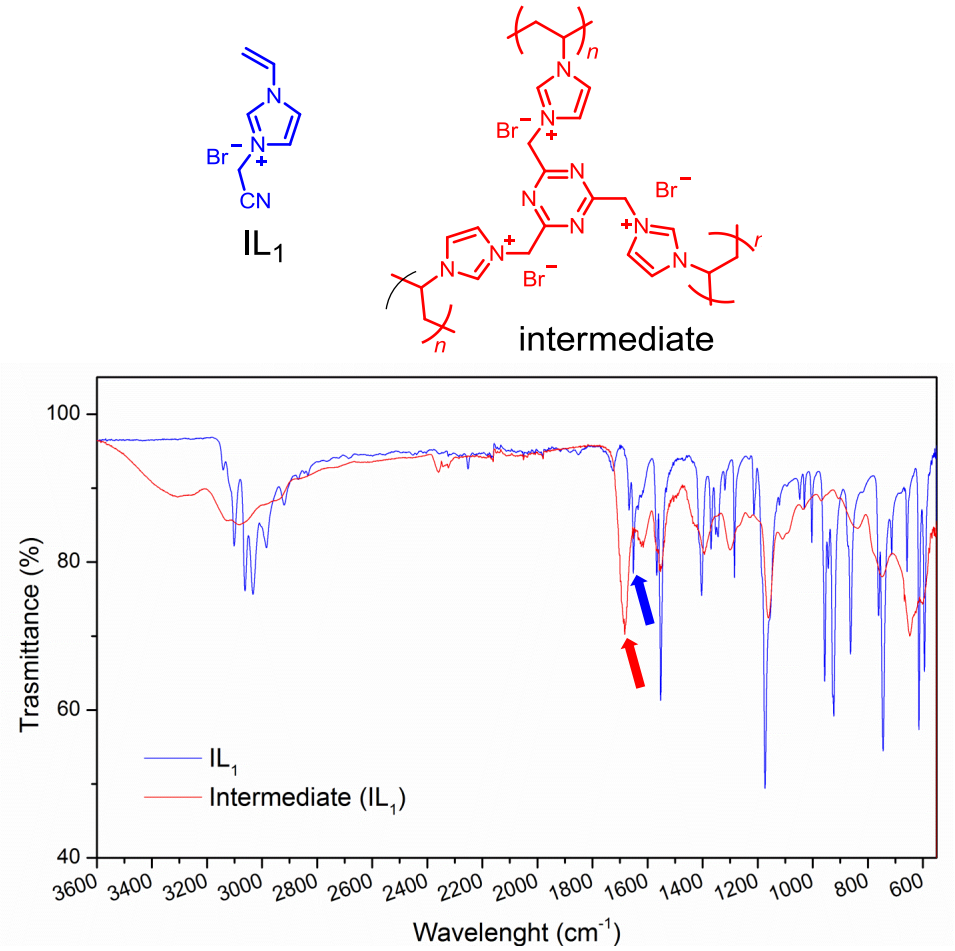
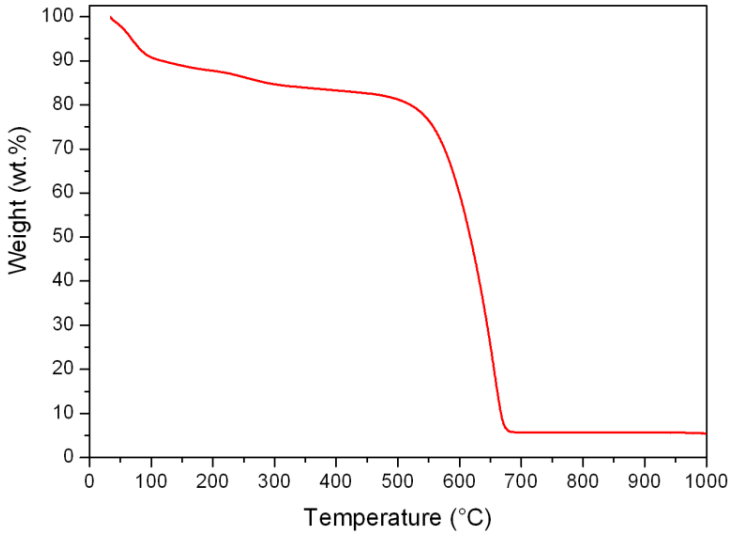
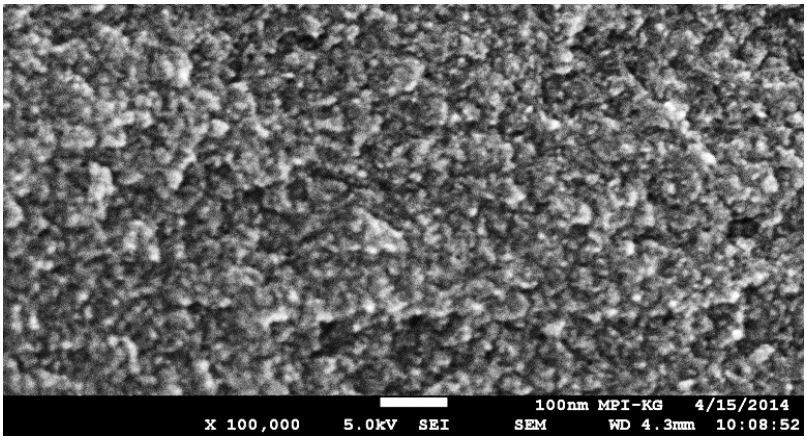


Figure S1. Top: Chemical structures of IL_1 and the crosslinked intermediate from IL_1. Bottom: FT-IR spectra of monomer IL_1 (blue line) and intermediate of $IL_1Z_{0.30}S_1T_{30}$ after pre-treatment at 250 °C (red line). On the one hand the vinyl monomer C=C stretching band at 1650 cm^{-1} (see blue arrow) on the blue line disappears after pre-treatment, indicating the polymerization of the vinyl monomers. On the other hand the characteristic band at 1682 cm^{-1} (see red arrow), depicting the presence of triazine rings, are found in the intermediate sample. It should be noted, the chemical structure model shown above the FTIR spectra is only an ideal case, as other side-reactions, such as partial thermal decomposition and the retro-quaternization reaction might also partially take place at this stage.





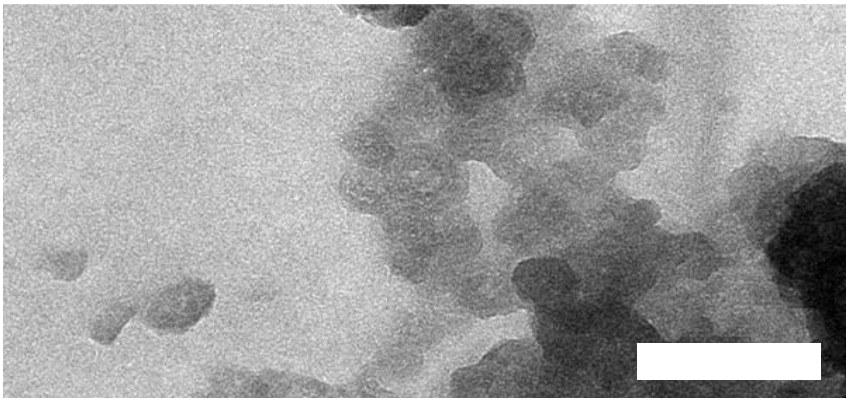


Figure S2. TGA curve under air flow (top), HR-SEM (middle) and TEM image (bottom) of the carbon sample $IL_1Z_{0.30}S_1T_{30}$ (Entry 3 in Table 1). Scale bars are 100 nm. The product is composed of primary small carbon nanoparticles of ca. 20-50 nm.

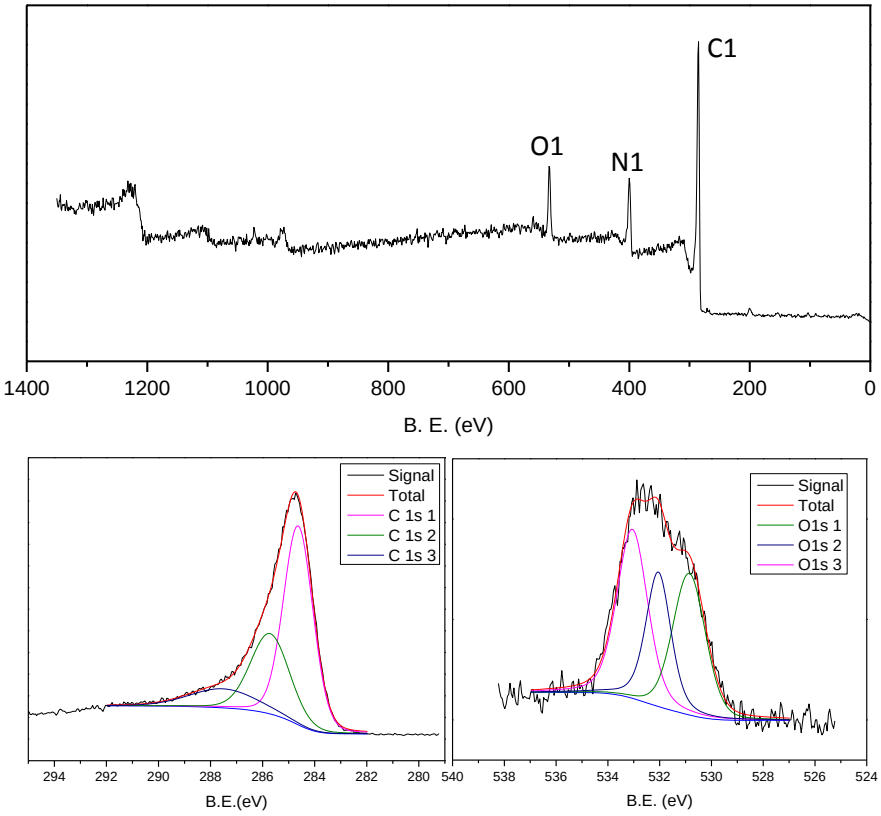


Figure S3. XPS survey (top), C1s (bottom left) and O1s (bottom right) spectra with deconvolution curves. The sample is $IL_1Z_{0.30}S_1T_{30}$.

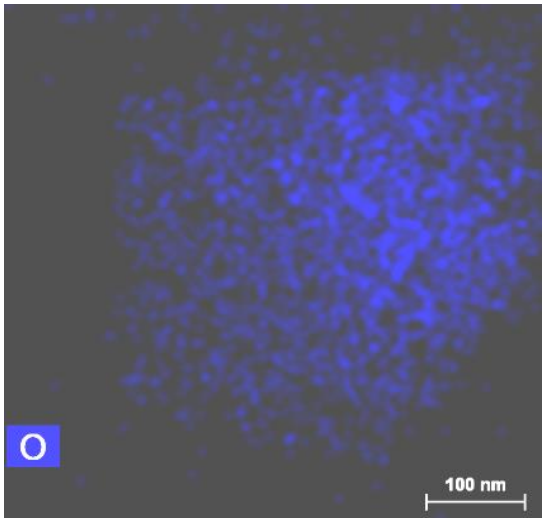


Figure S4. Oxygen elemental distribution of sample $IL_1Z_{0.30}S_1T_{30}$. The N and C distribution images are shown in Figure 2D and 2E.

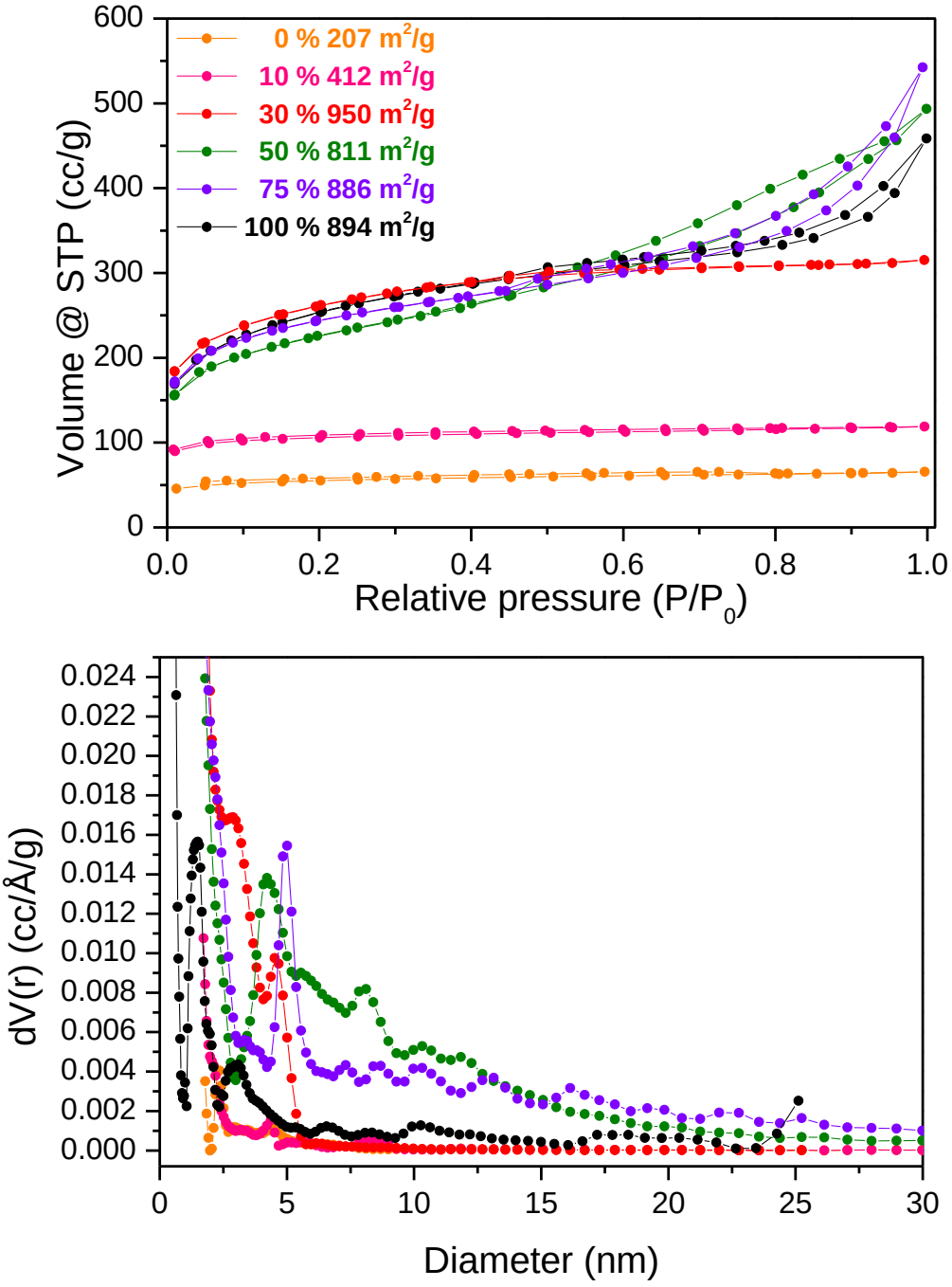


Figure S5. Isotherms (top) and pore size distributions (bottom, QSDFT method) at different wt.% of $ZnCl_2$ (Entry 1-6 in Table 1).

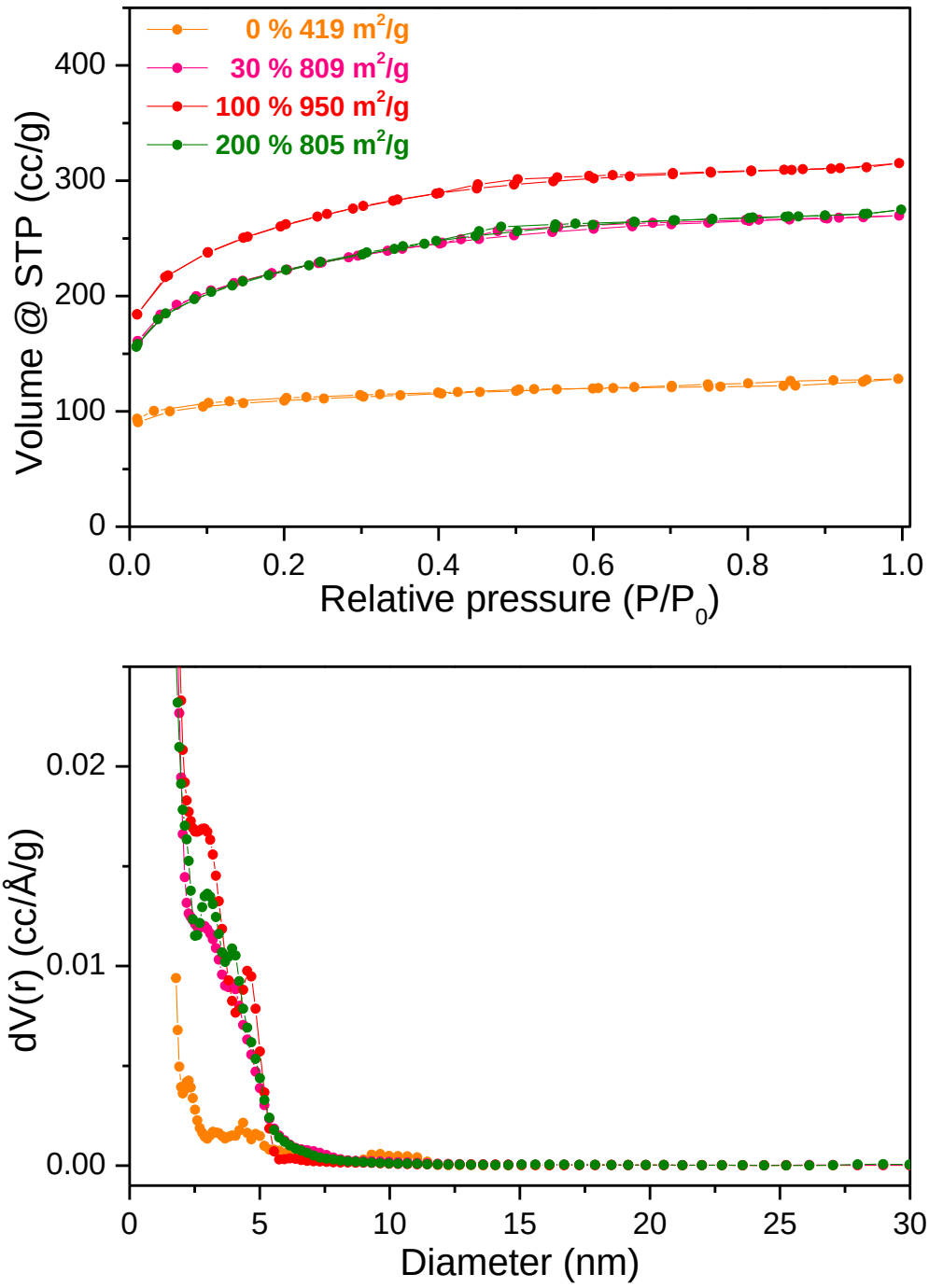


Figure S6. Isotherms (top) and pore size distributions (bottom, QSDFT method) at different wt.% of NaCl (Entry 7-10 in Table 1).

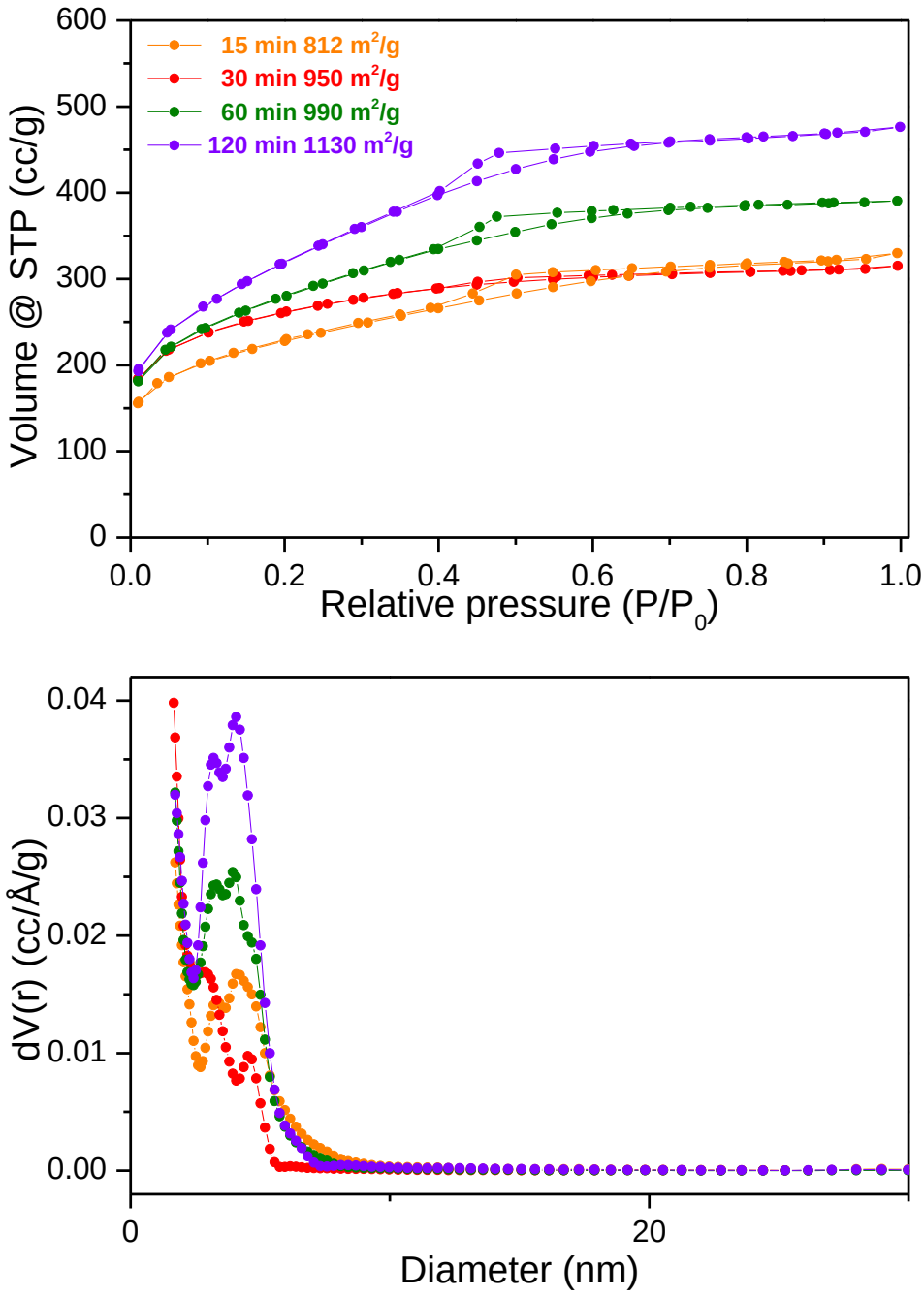


Figure S7. Isotherms (top) and pore size distributions (bottom, QSDFT method) at different times (Entry 11-13 in Table 1).

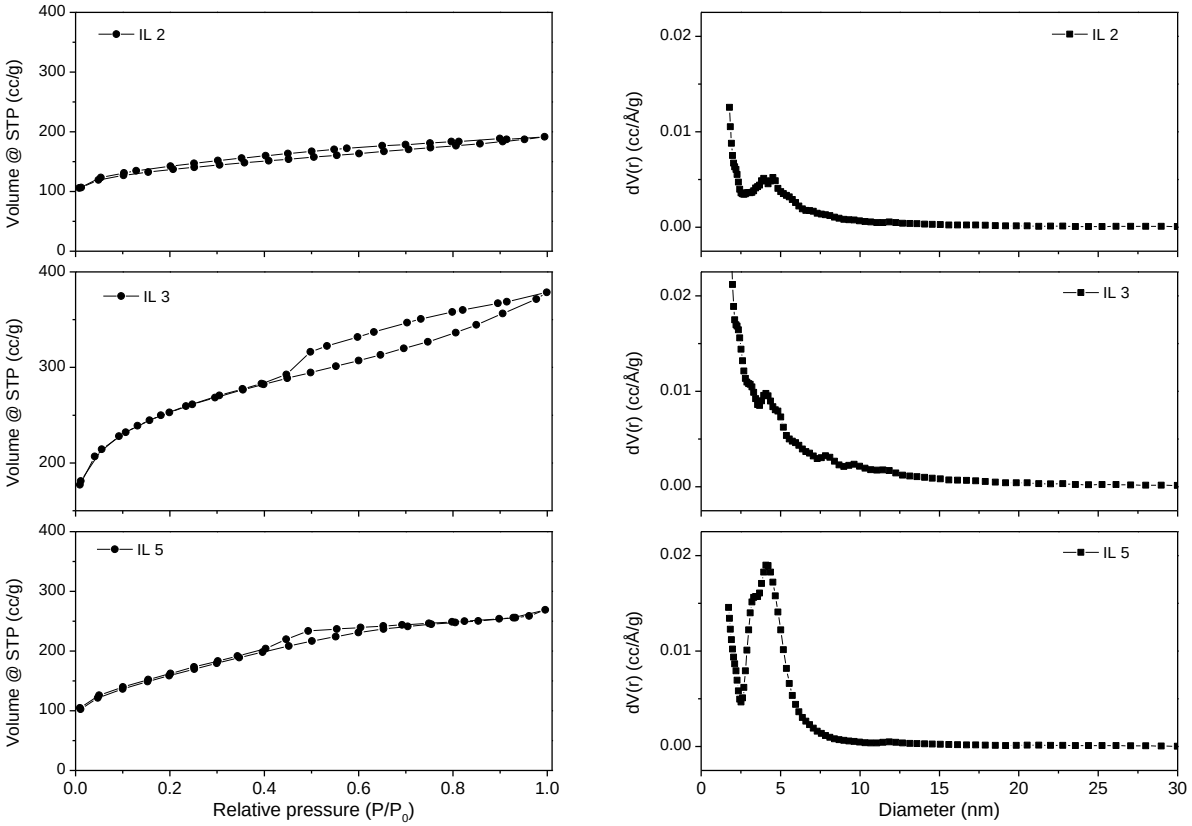


Figure S8. Isotherm (left) and pore size distribution curves (right, QSDFT method) for IL2, IL3 and IL5 (Entry 14, 15 and 17 respectively, in Table 1).

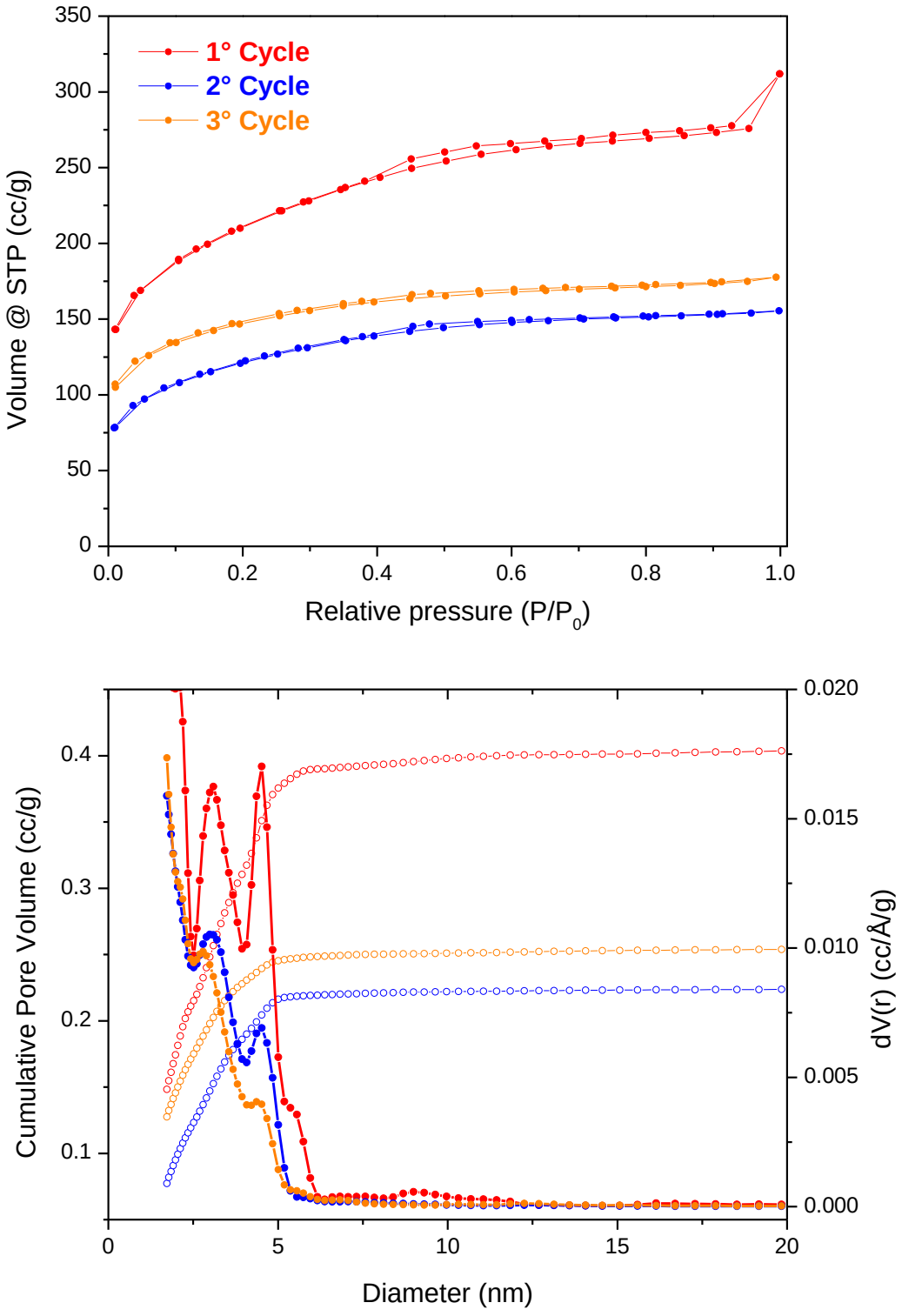


Figure S9. Isotherm curves (top) and pore size distributions (bottom, QSDFT method) for three recycling cycles by using sea salt with IL_1 (Entries 18 – 20 in Table 1).

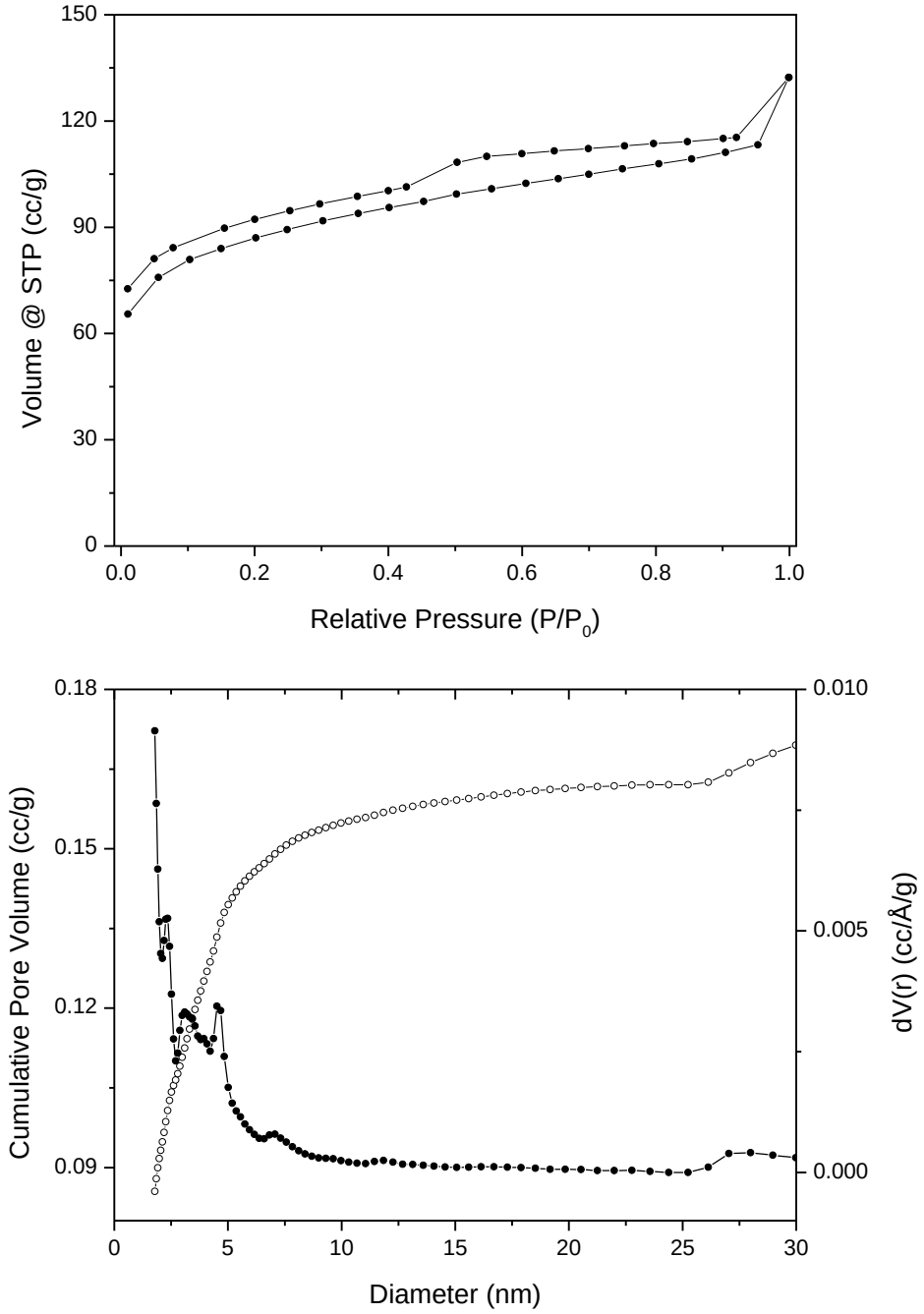


Figure S10. Isotherm curves (top) and pore size distributions (bottom, QSDFT method) for the the carbonization process in air by using adenine:$ZnCl_2$:NaCl in weight ratio of 1:0.3:1 (Entry 21 in Table 1).

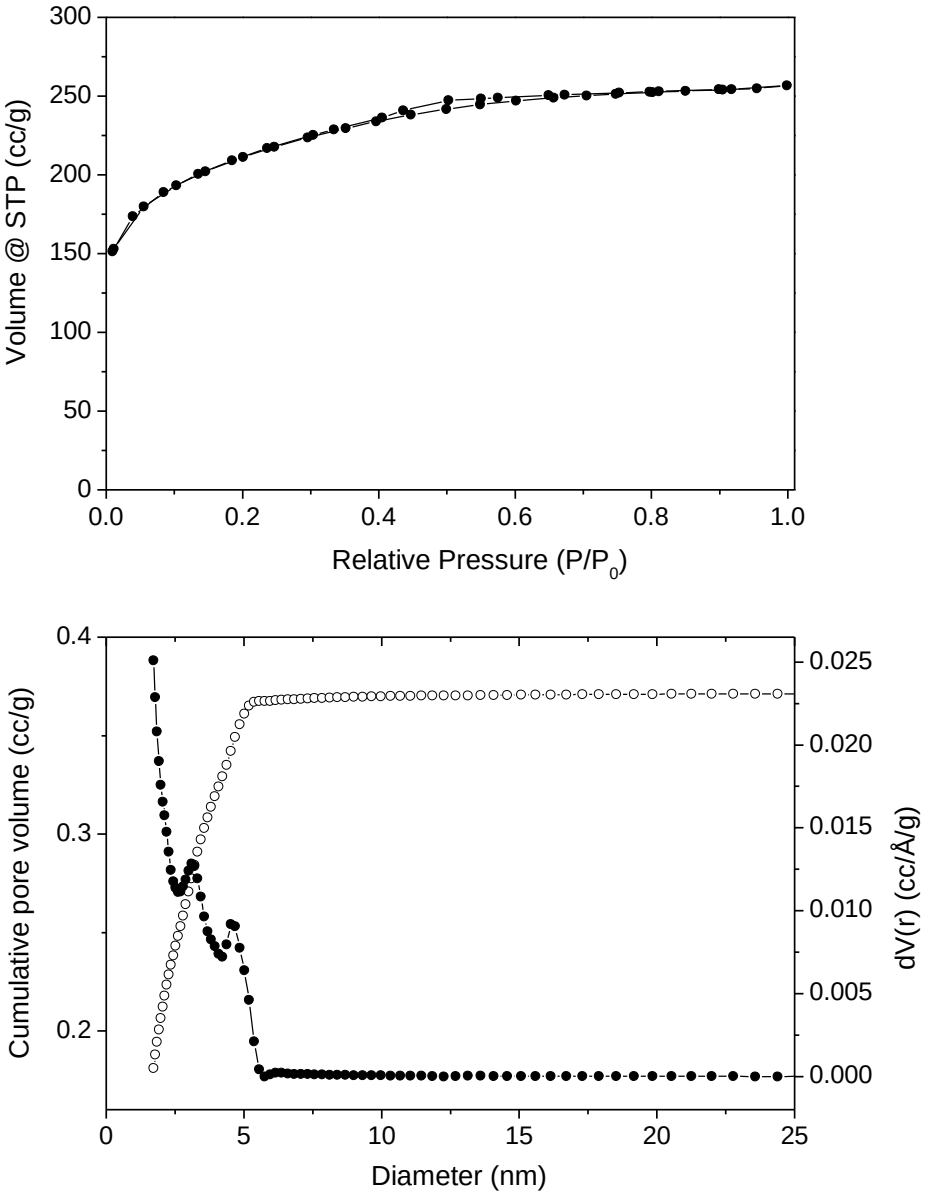


Figure S11. The nitrogen sorption isotherm (top) and the pore size distributions (bottom, QSDFT method) for the the carbon prepared in the similar conditions to the carbon of Entry 3 in Table 1 except that the carbonization was performed **under nitrogen**.

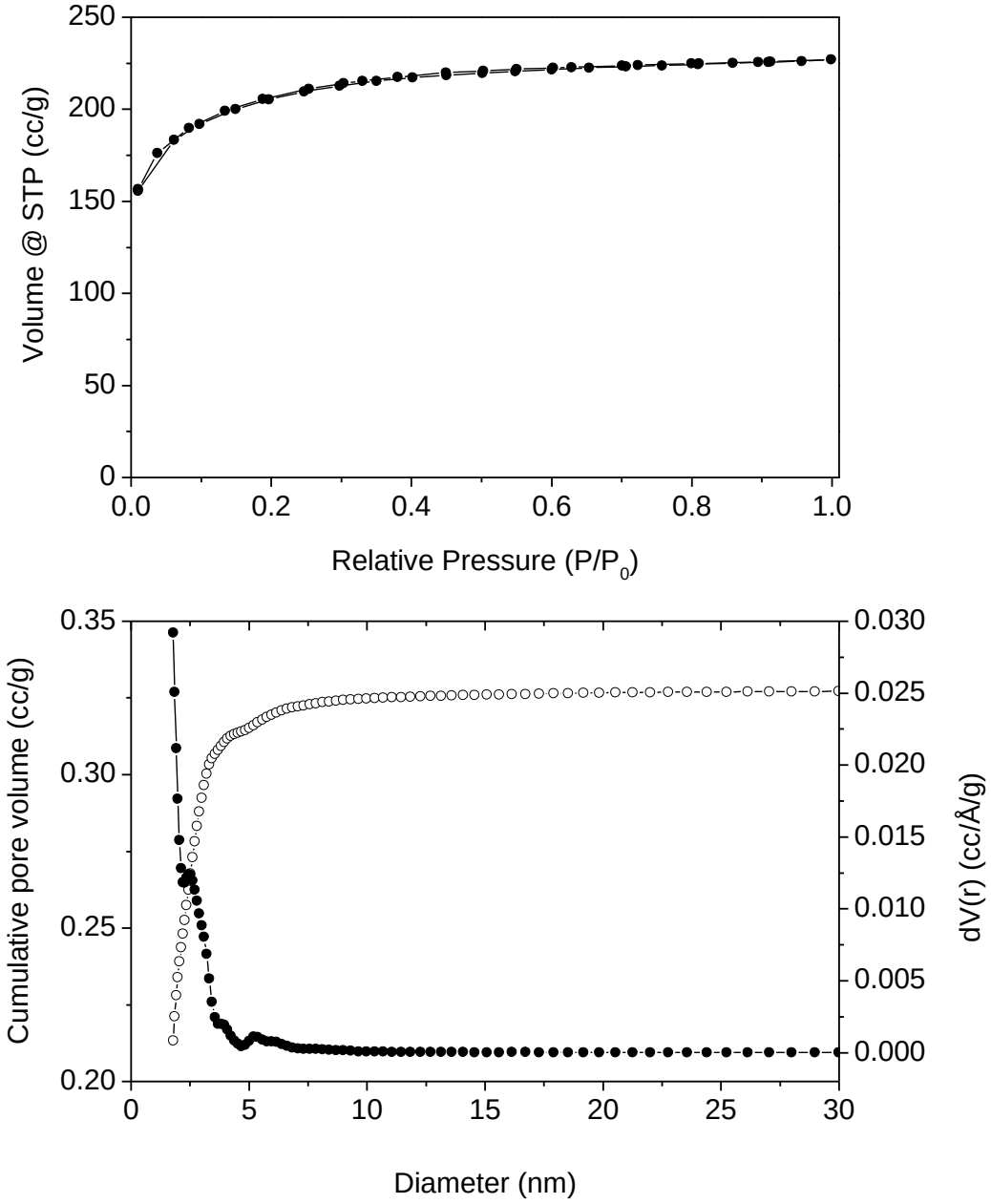


Figure S12. Isotherm curves (top) and pore size distributions (bottom, QSDFT method) for the carbon prepared in the similar conditions to the carbon of Entry 3 in Table 1 except that the carbonization was performed **under nitrogen without the NaCl protecting layer**.

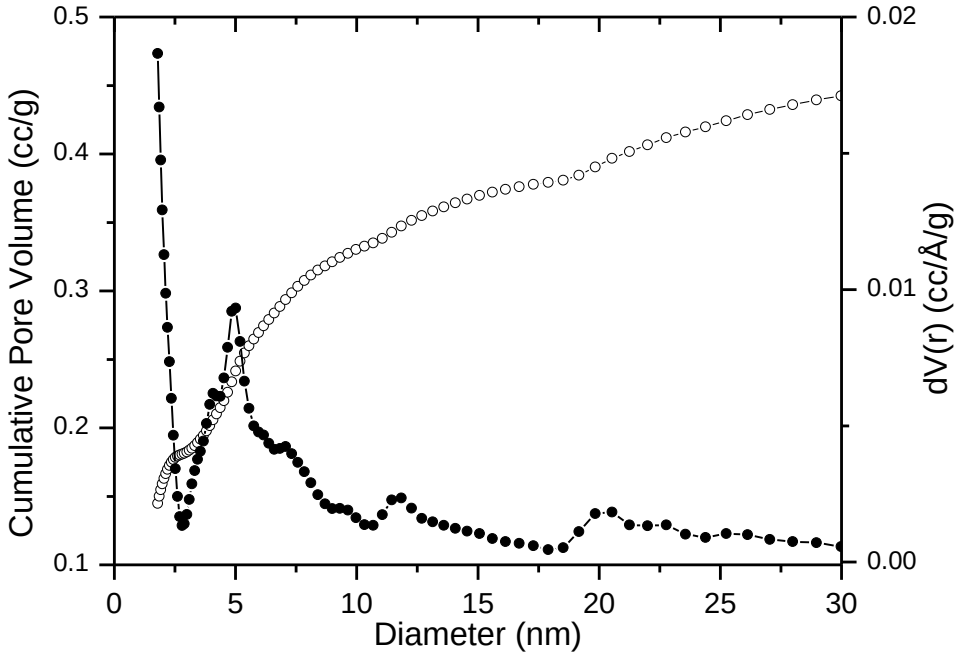


Figure S13. Pore size distribution (QSDFT method) for carbon obtained from oak leaves and red sea salt (Entry 22 in Table 1).