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Supplementary Information

Sodium ion removal by hydrated vanadyl phosphate for electrochemical water desalination

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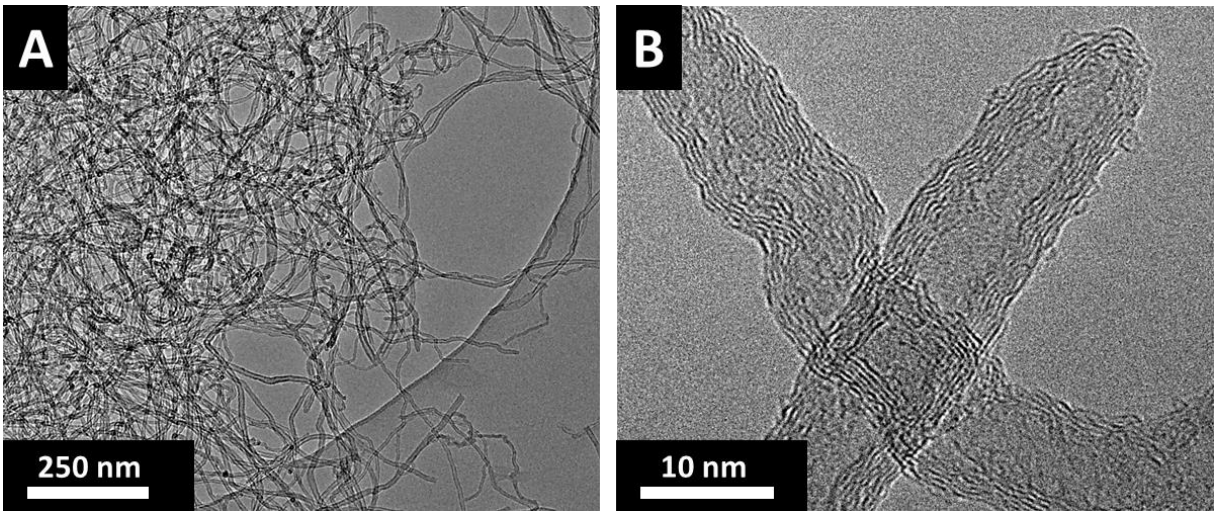

Figure S1: Transmission electron micrographs of Nanocyl NC7000 taken with a JEOL 2100F transmission electron microscope at 200 kV. The powder samples were prepared by dispersing the powders in ethanol and drop casting them on a copper grid with a lacey carbon (Gatan).

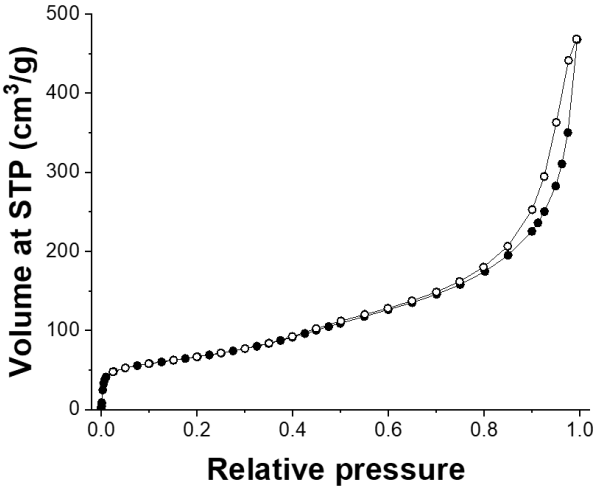

Figure S2: Argon gas sorption isotherm recorded at -186 °C. The measurement was carried out with an Autosorb iQ system (Quantachrome). The samples were degassed at 200 °C for 10 h at 10^2 Pa. The Brunauer-Emmett-Teller specific surface area was calculated in the linear relative pressure range of 0.06-0.3. STP stands for "standard temperature and pressure."

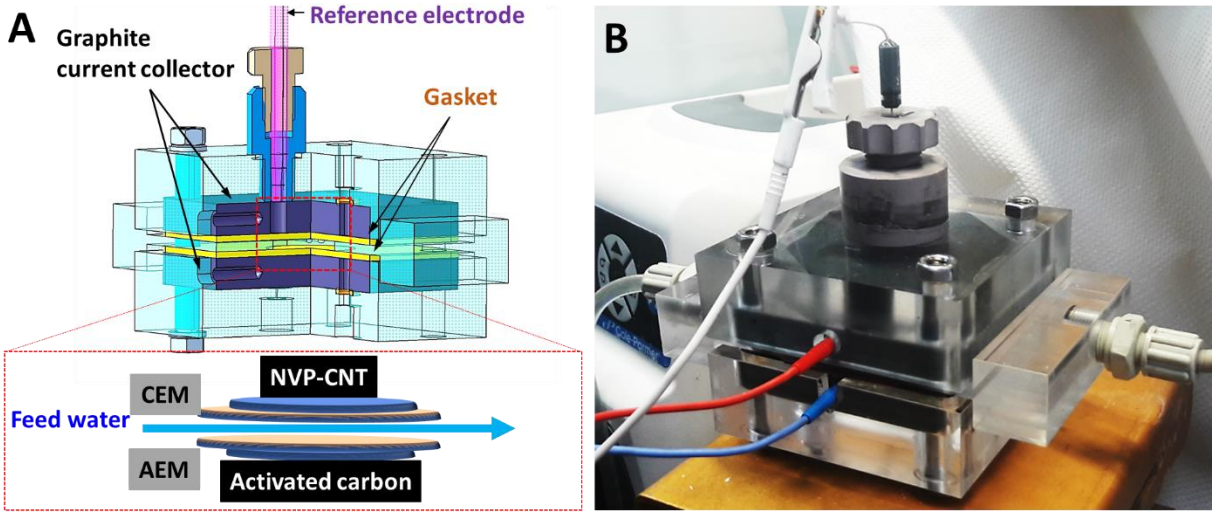

Figure S3: (A) Scheme of the cell. (B) A photo of the cell during desalination operation. CEM: cation exchange membrane; AEM: anion exchange membrane.

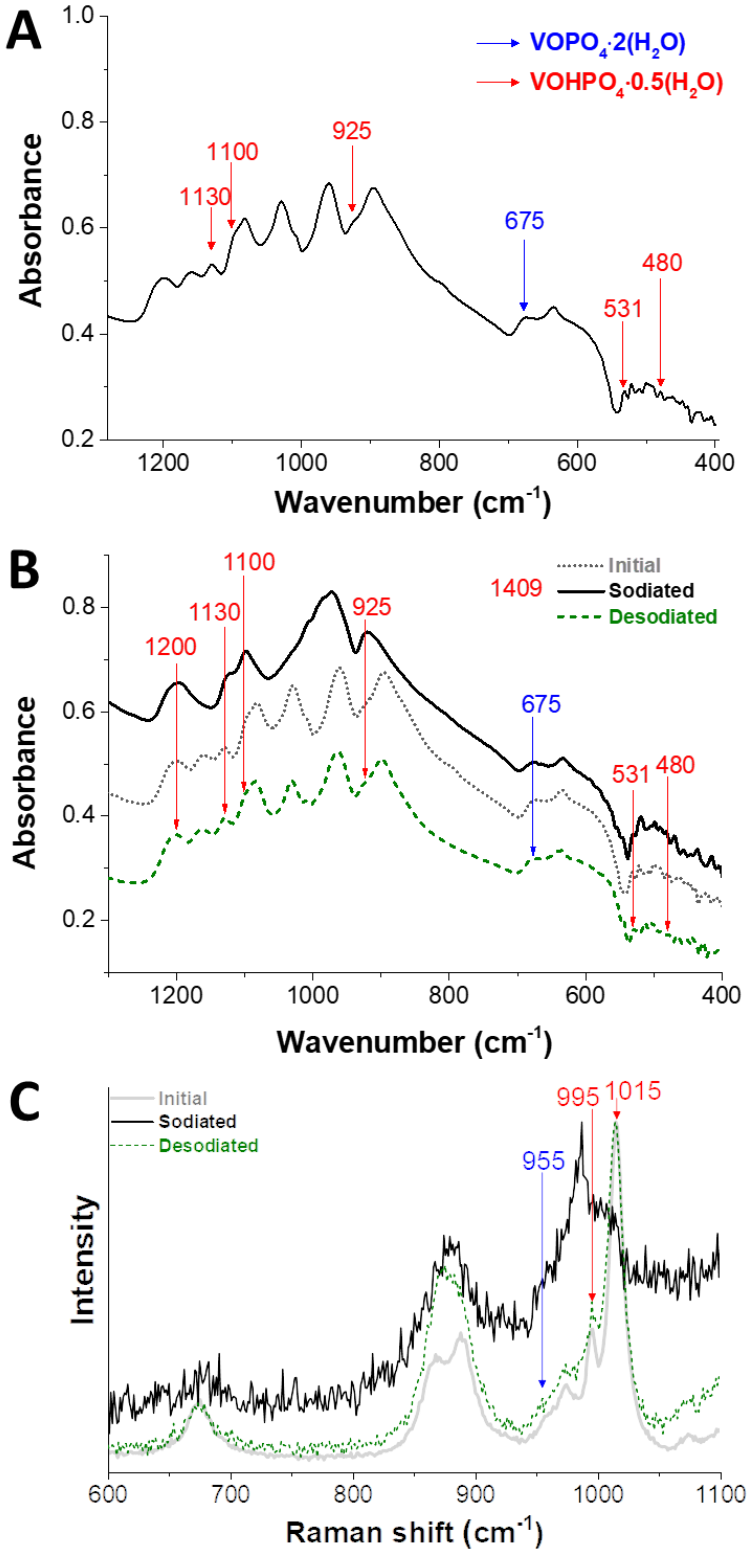

Figure S4: (A-B) Infrared spectra of the NVP-CNT electrode initially (A) and after electrochemical operation (B). (C) Raman spectra of the NVP-CNT electrode after electrochemical operation.

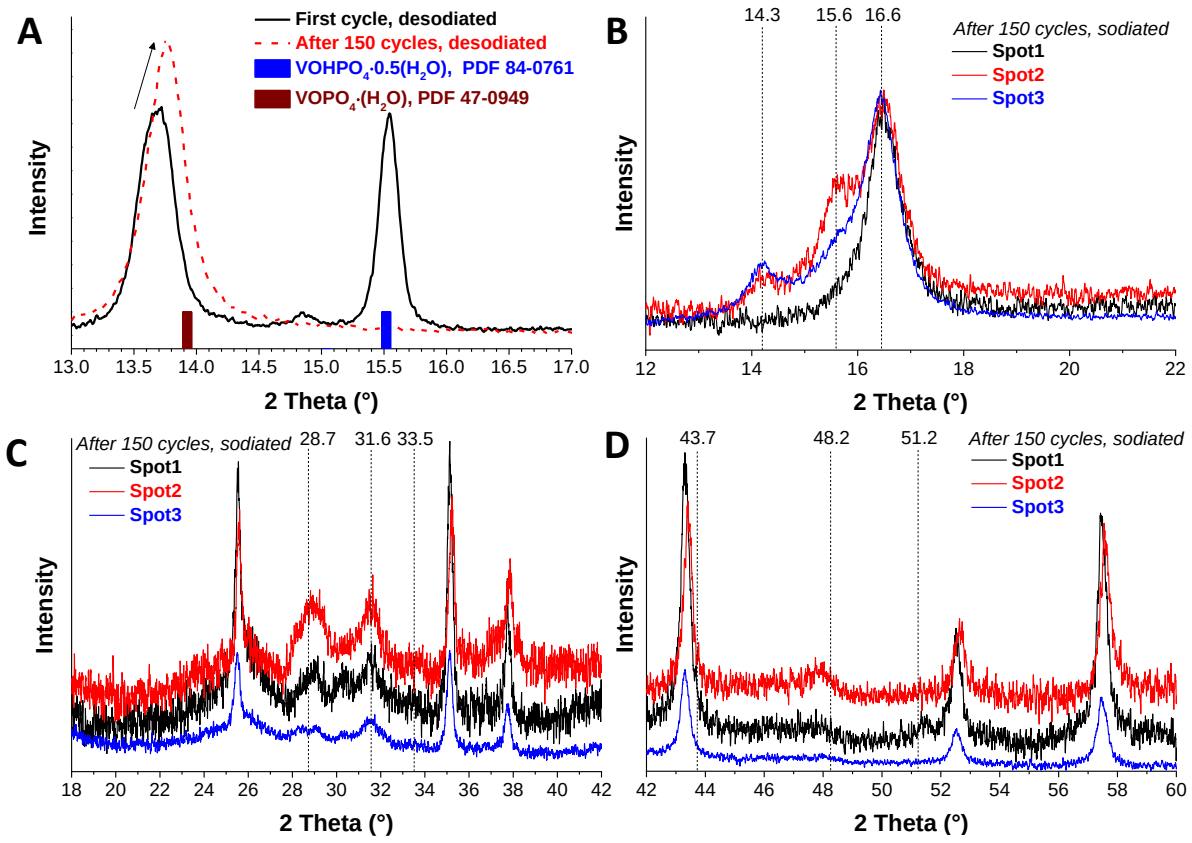

Figure S5: X-ray diffractograms of the NVP-CVT electrodes with the desodiated state before and after 150 cycles (A), with the sodiated state after 150 cycles for 3 different spots (B-D).

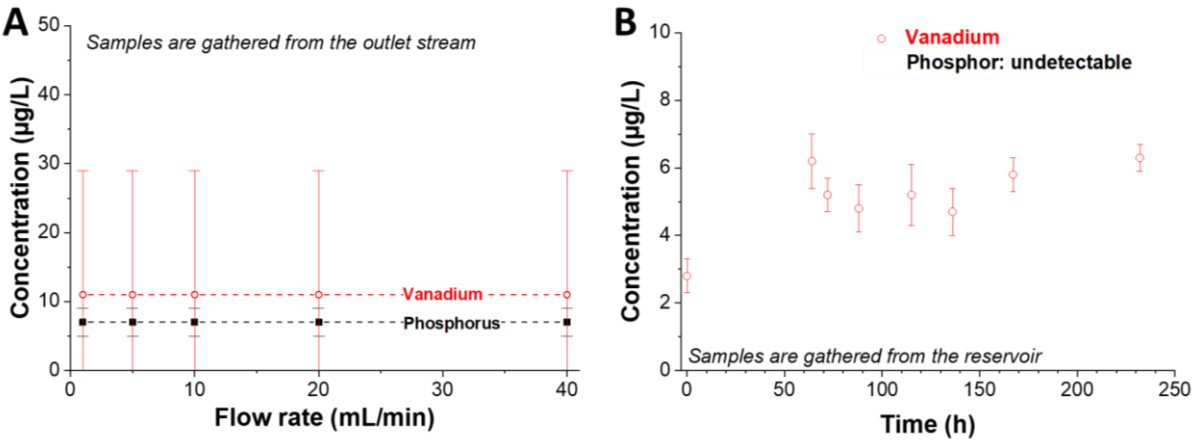

Figure S6: Phosphor and vanadium concentration determined by ICP-OES analysis of the water sample collected from the outlet stream of the desalination cell at A) at different flow rates and (B) different times.