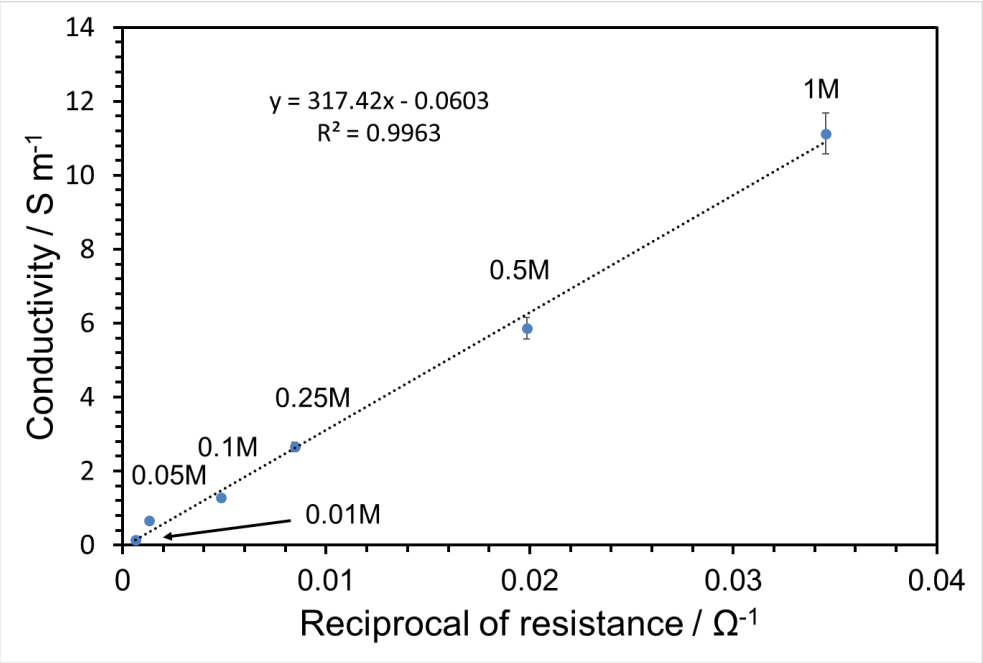

Figure S1. Aqueous KCl solution conductivity as function of reciprocal of resistance.

Table S1. Resistance and conductivity of 1 mol dm^{-3} $NaClO_4$ in 1:1 EC/DEC electrolyte at various temperatures

Temperature (°C)	Resistance (Ω)	Conductivity (S m^{-1})
10	561	0.566
15	501	0.633
20	468	0.678
25	396	0.802
40	370	0.857
50	318	0.999
60	271	1.17
70	236	1.34
80	220	1.44

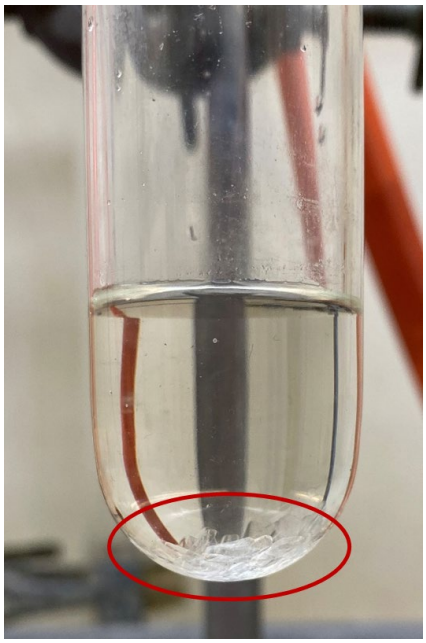

Figure S2. Photograph of 1 mol dm^{-3} $NaClO_4$ in 1:1 EC/DEC after standing overnight around 20 °C.

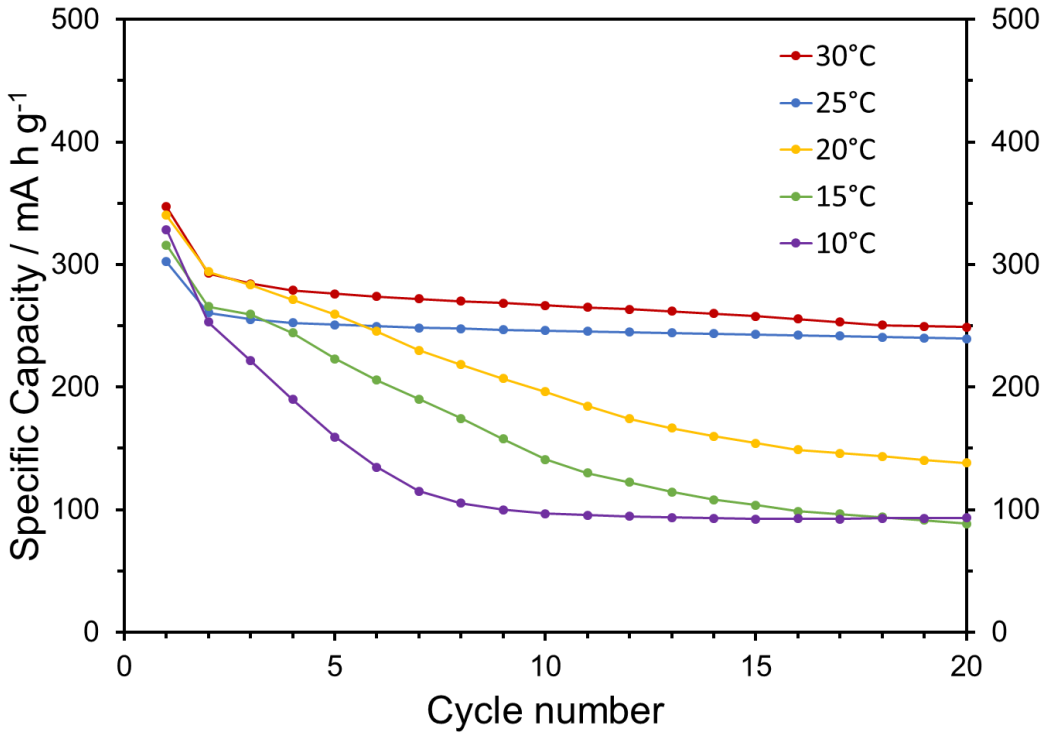

Figure S3. Reduction specific capacity of HC at temperatures from 10 to 30 °C between 0.001 and 2 V (*vs.* Na^+/Na) at 100 mA g^{-1} in sodium half-cells.

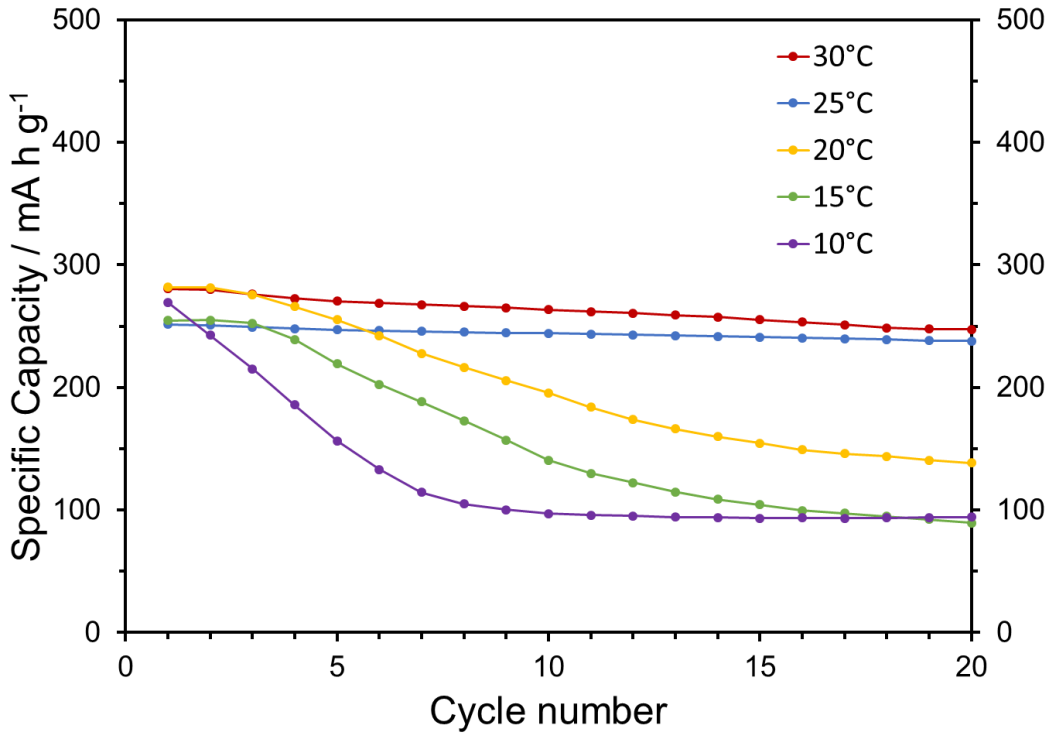

Figure S4. Oxidation specific capacity of HC at temperatures from 10 to 30 °C between 0.001 and 2 V (*vs.* Na^+/Na) at 100 mA g^{-1} in sodium half-cells.

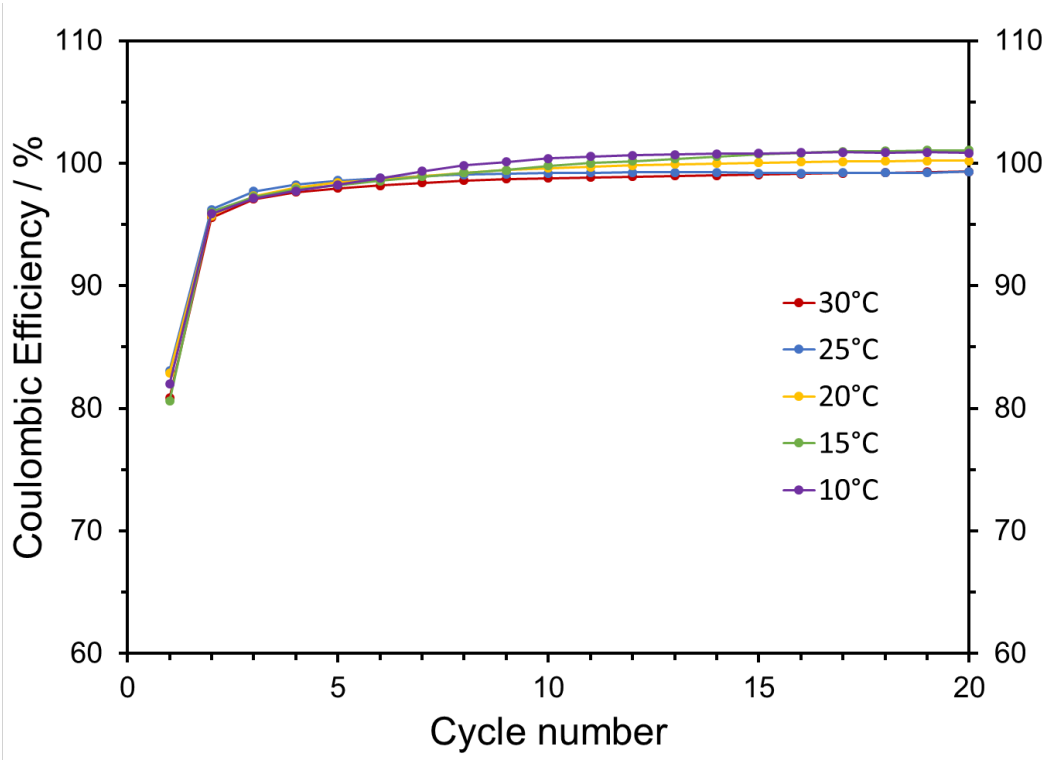

Figure S5. Coulombic efficiency of HC at temperatures from 10 to 30 °C cycled between 0.001 and 2 V (*vs.* Na^+/Na) at 100 mA g^{-1} in sodium half-cells.

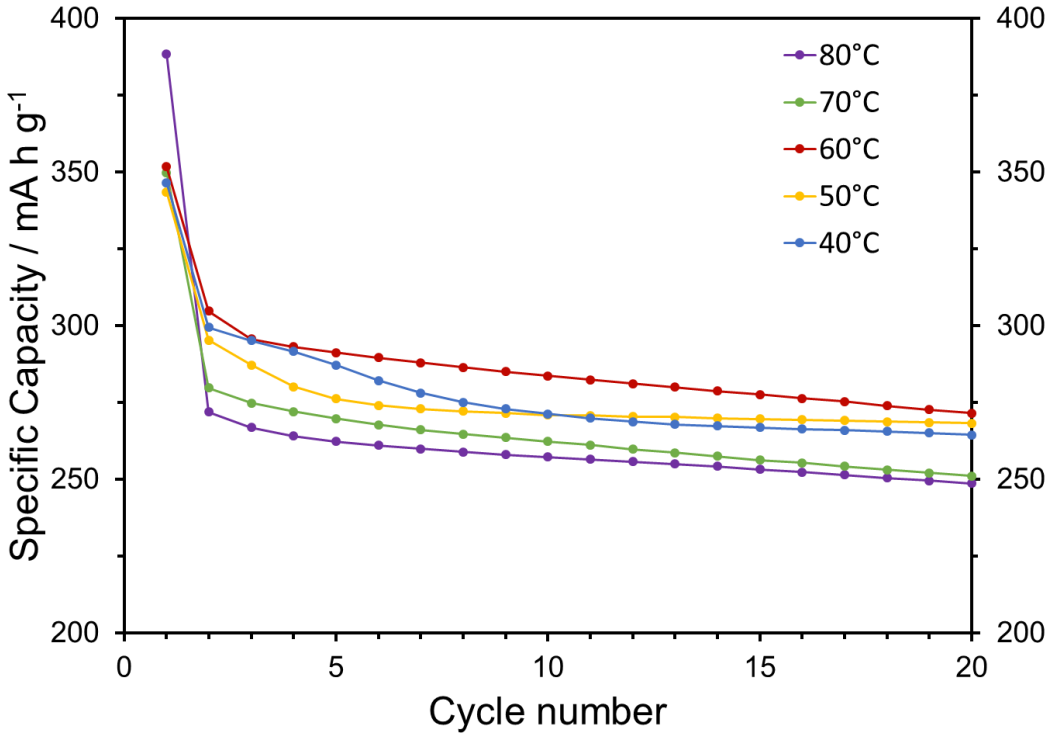

Figure S6. Reduction specific capacity of HC at temperatures from 40 to 80 °C between 0.001 and 2 V (*vs.* Na^+/Na) at 100 mA g^{-1} in sodium half-cells.

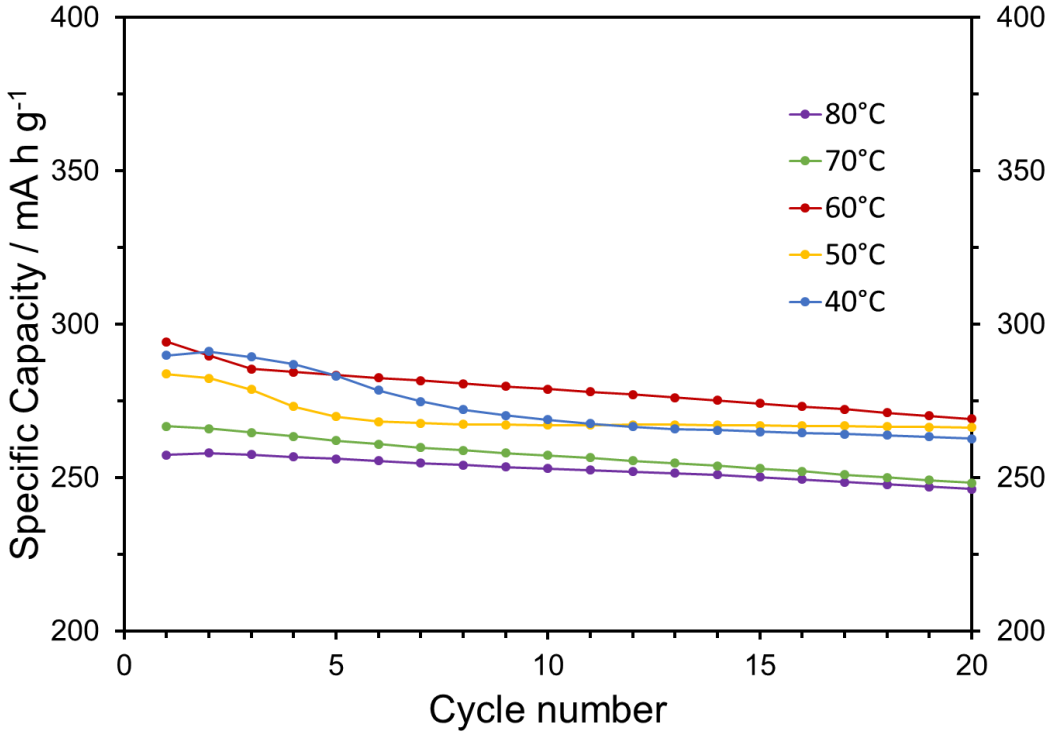

Figure S7. Oxidation specific capacity of HC at temperatures from 40 to 80 °C between 0.001 and 2 V (*vs.* Na^+/Na) at 100 mA g^{-1} in sodium half-cells.

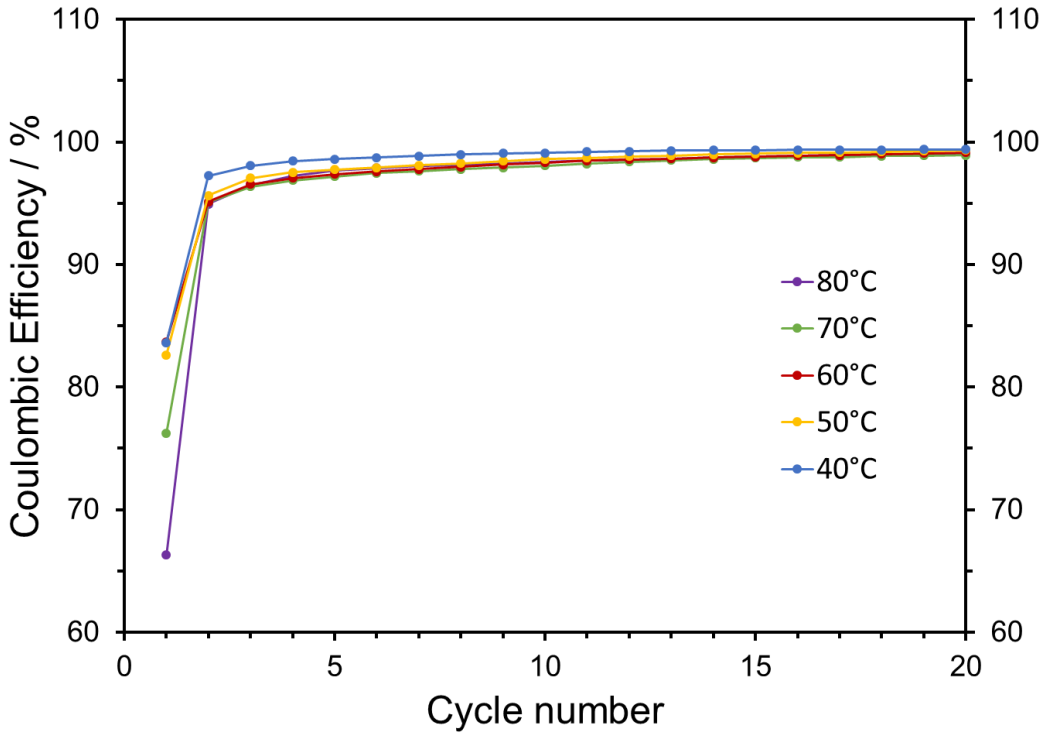

Figure S8. Coulombic efficiency of HC at temperatures from 40 to 80 °C cycled between 0.001 and 2 V (*vs.* Na^+/Na) at 100 mA g^{-1} in sodium half-cells.

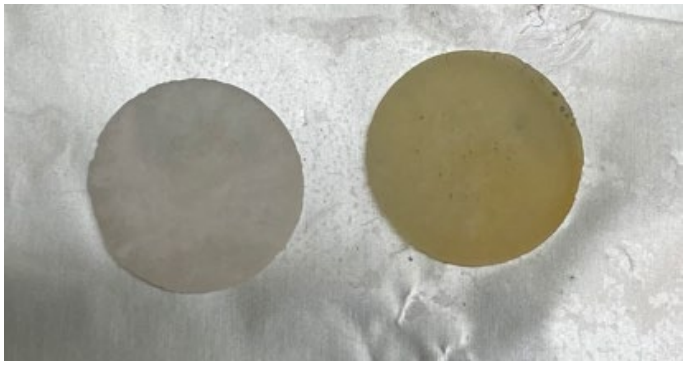

Figure S9. Separators (12 mm discs) after 20 cycles at 25 °C (left) and 60 °C (right).

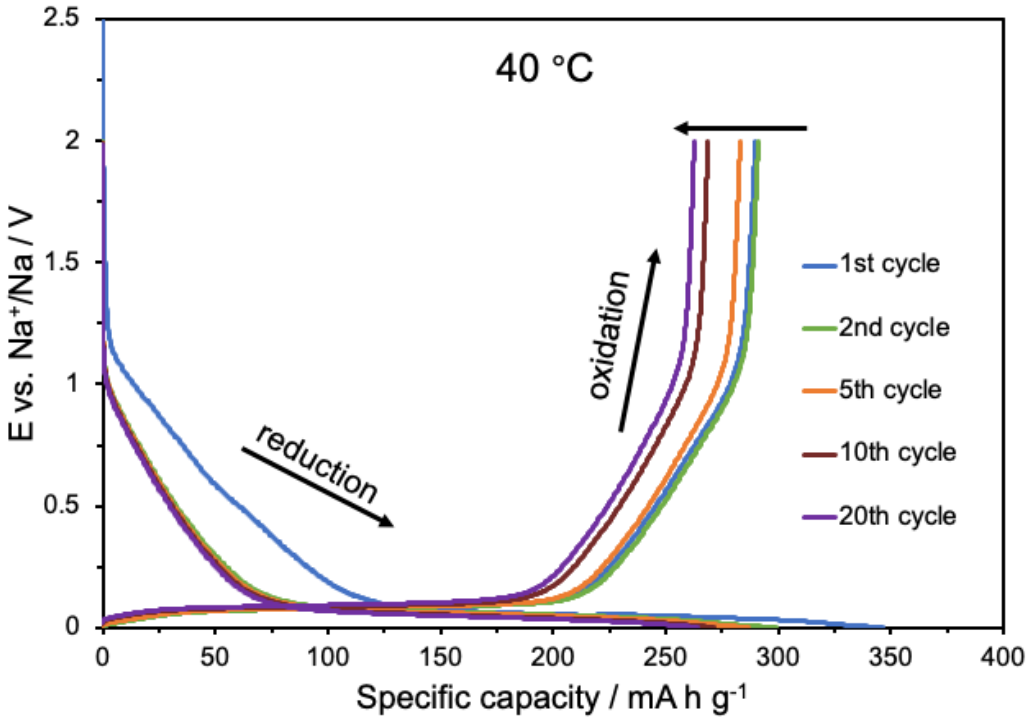

Figure S10. Voltage-capacity plots of galvanostatic cycling data at 100 mA g^{-1} current for HC at the 1st, 2nd, 5th, 10th and 20th cycle at 40 °C.

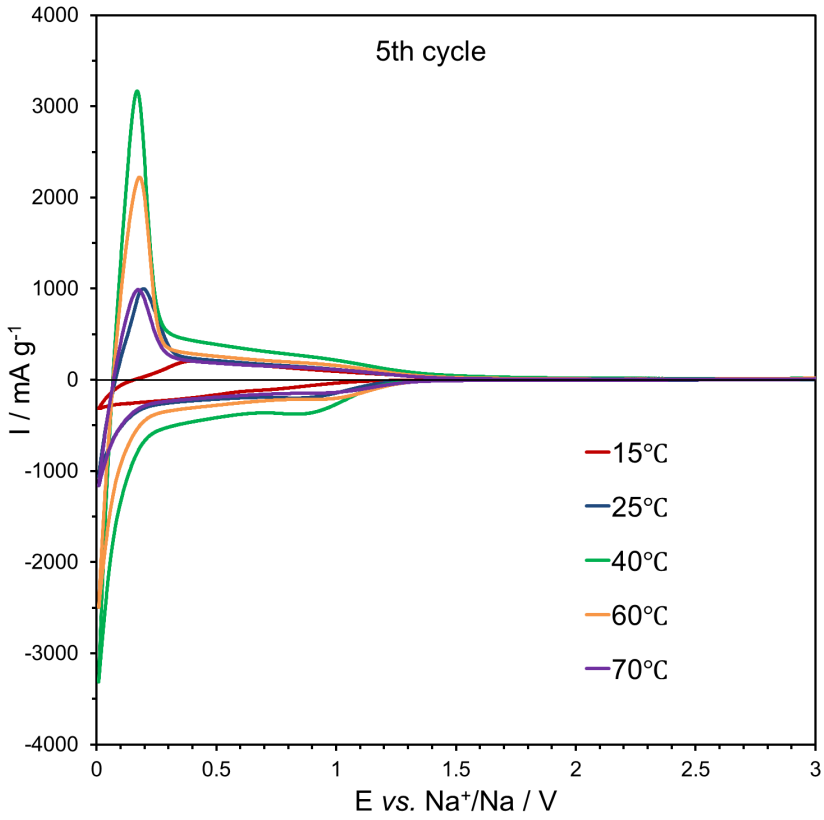

Figure S11. CV profile of the 5th cycle of HC at temperatures from 15 to 70 °C at 1 mV s^{-1} scan rate between 3 and 0.01 V *vs.* Na^+/Na.

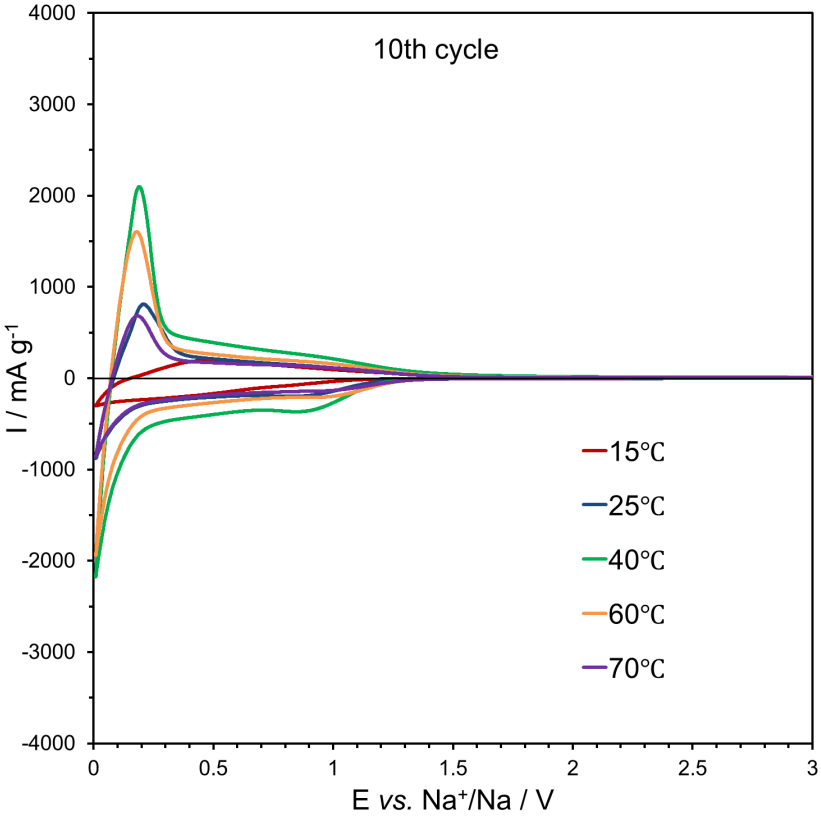

Figure S12. CV profile of the 10th cycle of HC at temperatures from 15 to 70 °C at 1 mV s^{-1} scan rate between 3 and 0.01 V *vs.* Na^+/Na.

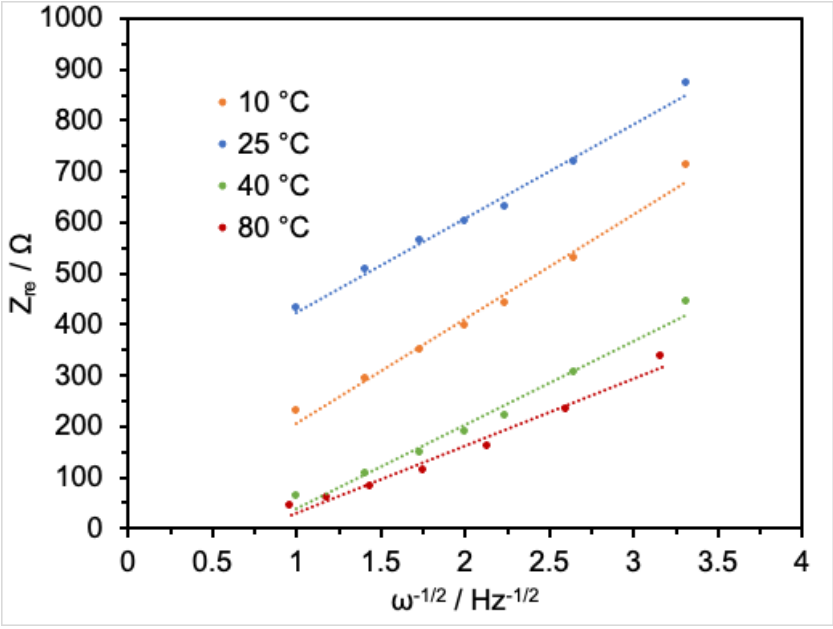

Figure S13. The relationship between Z_{re} and $\omega^{-1/2}$ at low frequency with freshly prepared cells at 10, 25, 40 and 80 °C

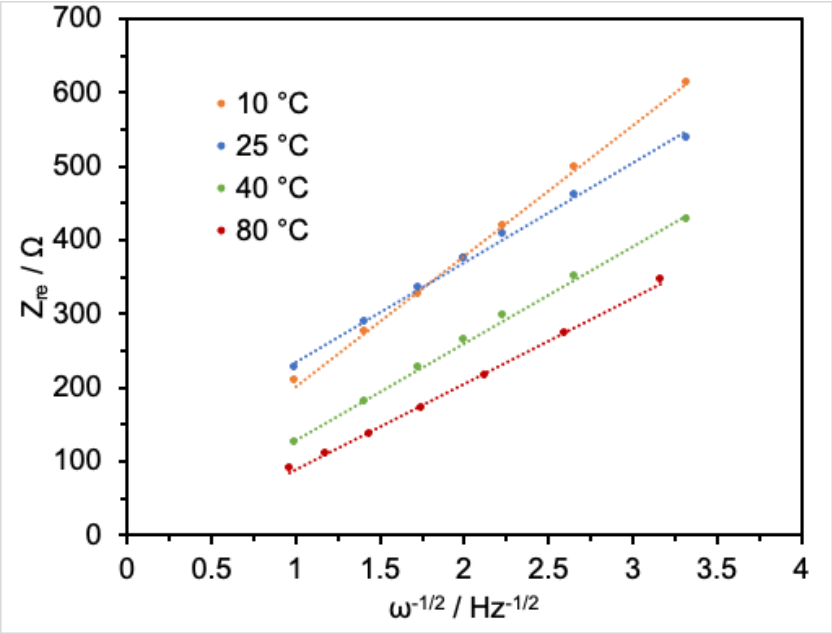

Figure S14. The relationship between Z_{re} and $\omega^{-1/2}$ at low frequency with cycled 19 times cells at 10, 25, 40 and 80 °C.

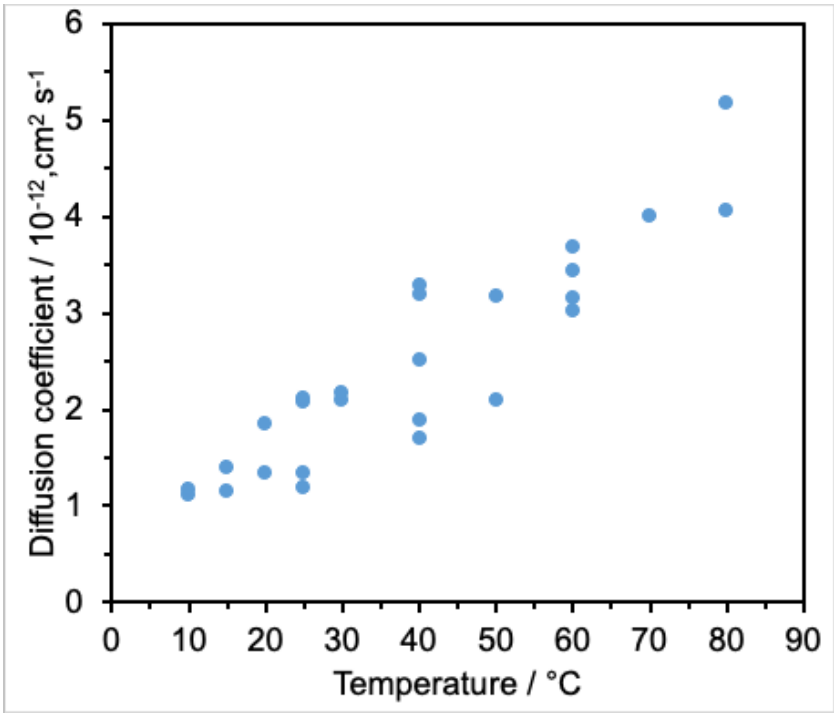

Figure S15. Na ion diffusion coefficients after 19 cycles at temperatures from 10 to 80 °C.

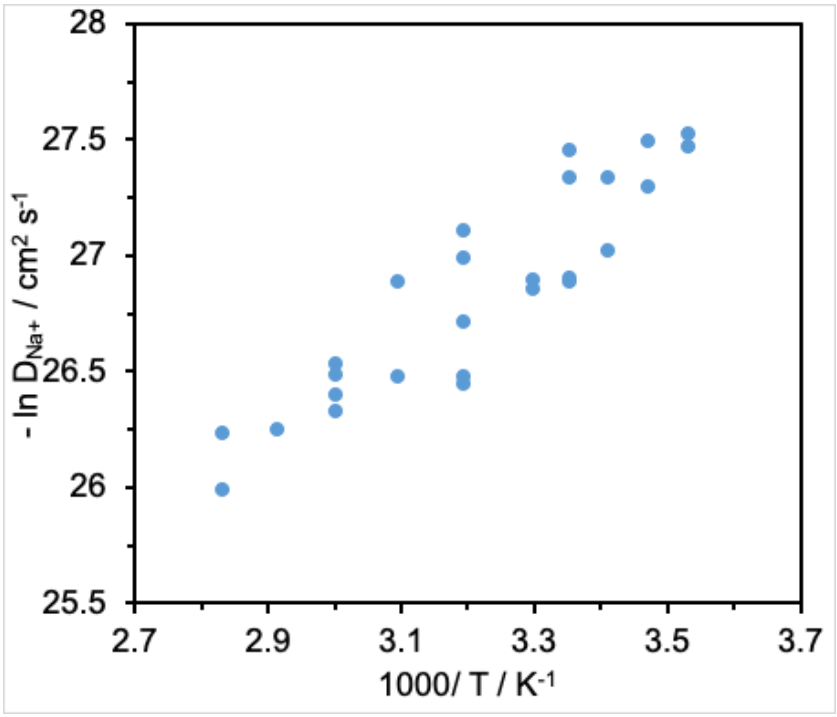

Figure S16. Dependence of the natural logarithm of the Na^+ diffusion coefficient on reciprocal temperature.

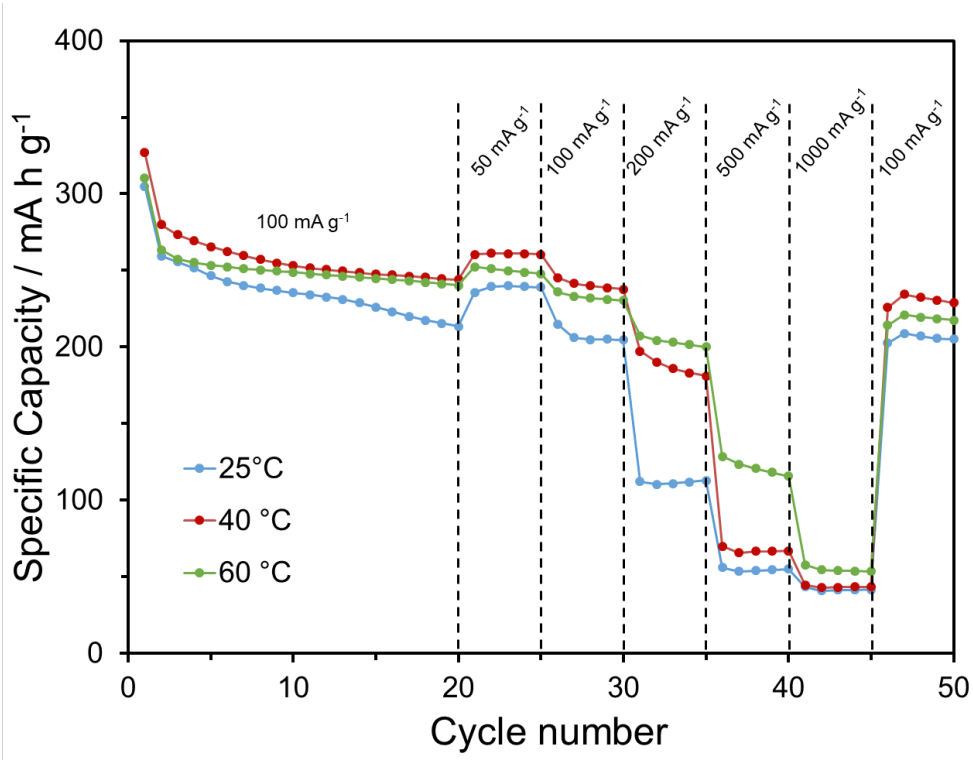

Figure S17. Rate capability of HC reduction capacity at different current densities and at temperatures of 25, 40 and 60 °C.

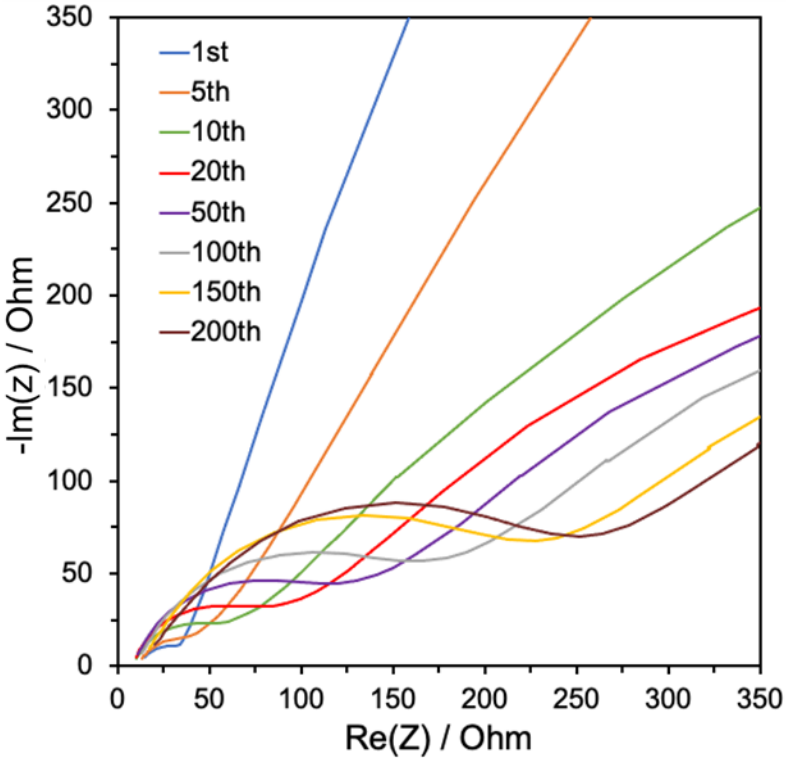

Figure S18. Nyquist plots of HC electrode after different numbers of cycles at 25 °C long-term cycling.

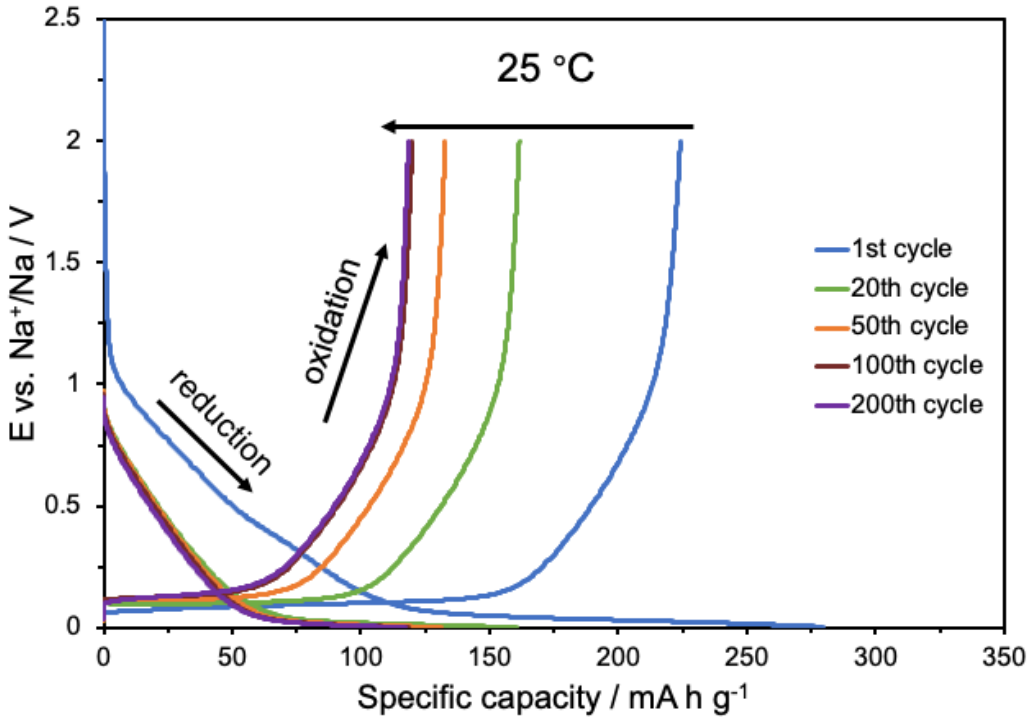

Figure S19. Voltage-capacity plots of galvanostatic cycling data at 100 mA g^{-1} current for HC at the 1st, 20th, 50th, 100th and 200th cycle at 25 °C.

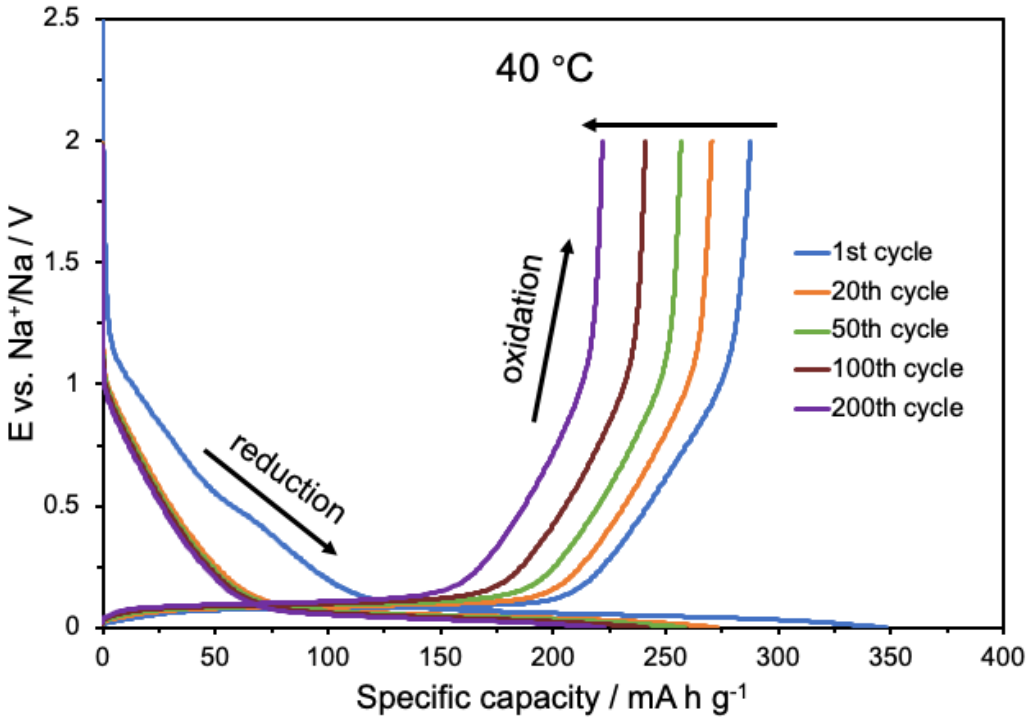

Figure S20. Voltage-capacity plots of galvanostatic cycling data at 100 mA g^{-1} current for HC at the 1st, 20th, 50th, 100th and 200th cycle at 40 °C.