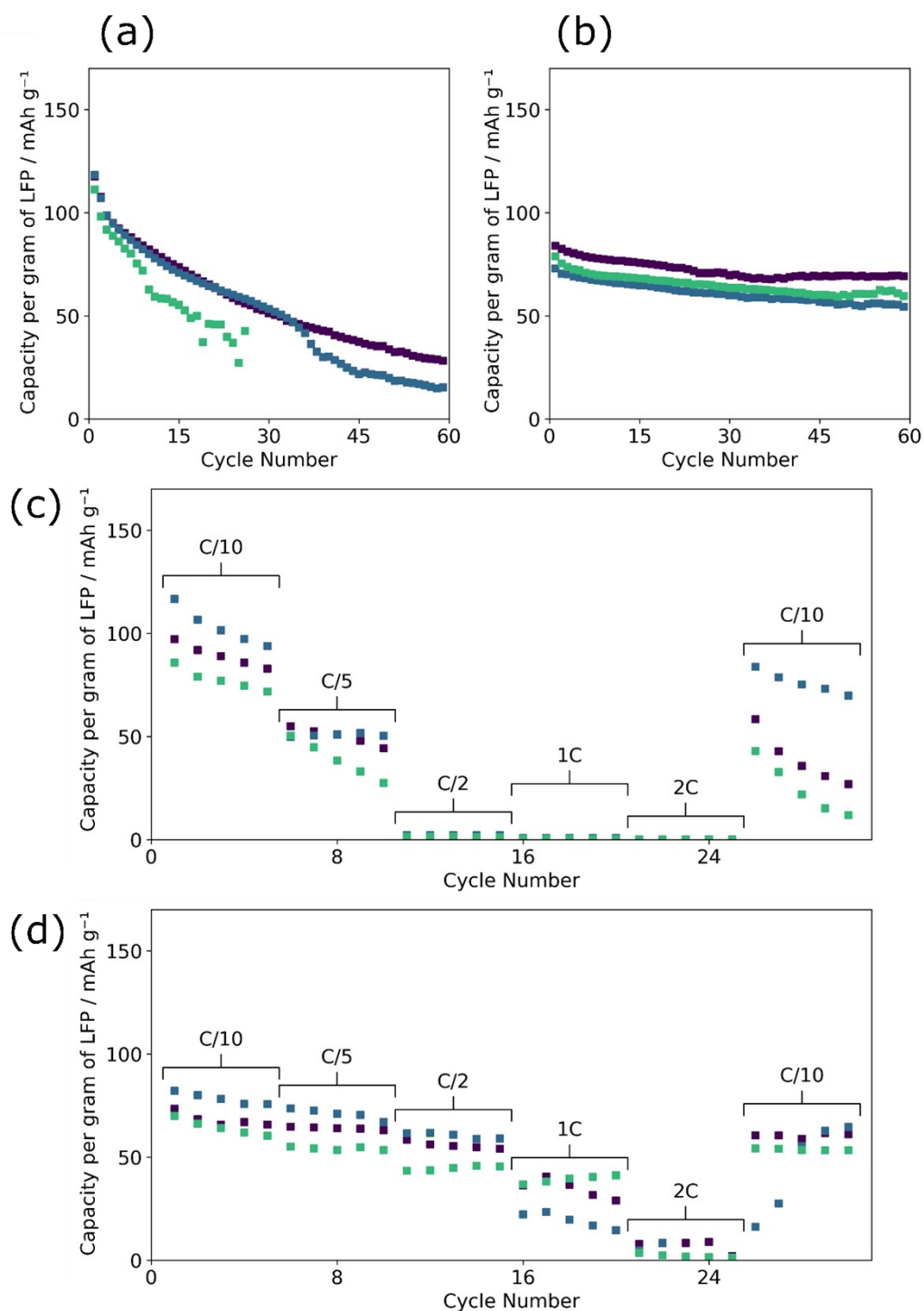
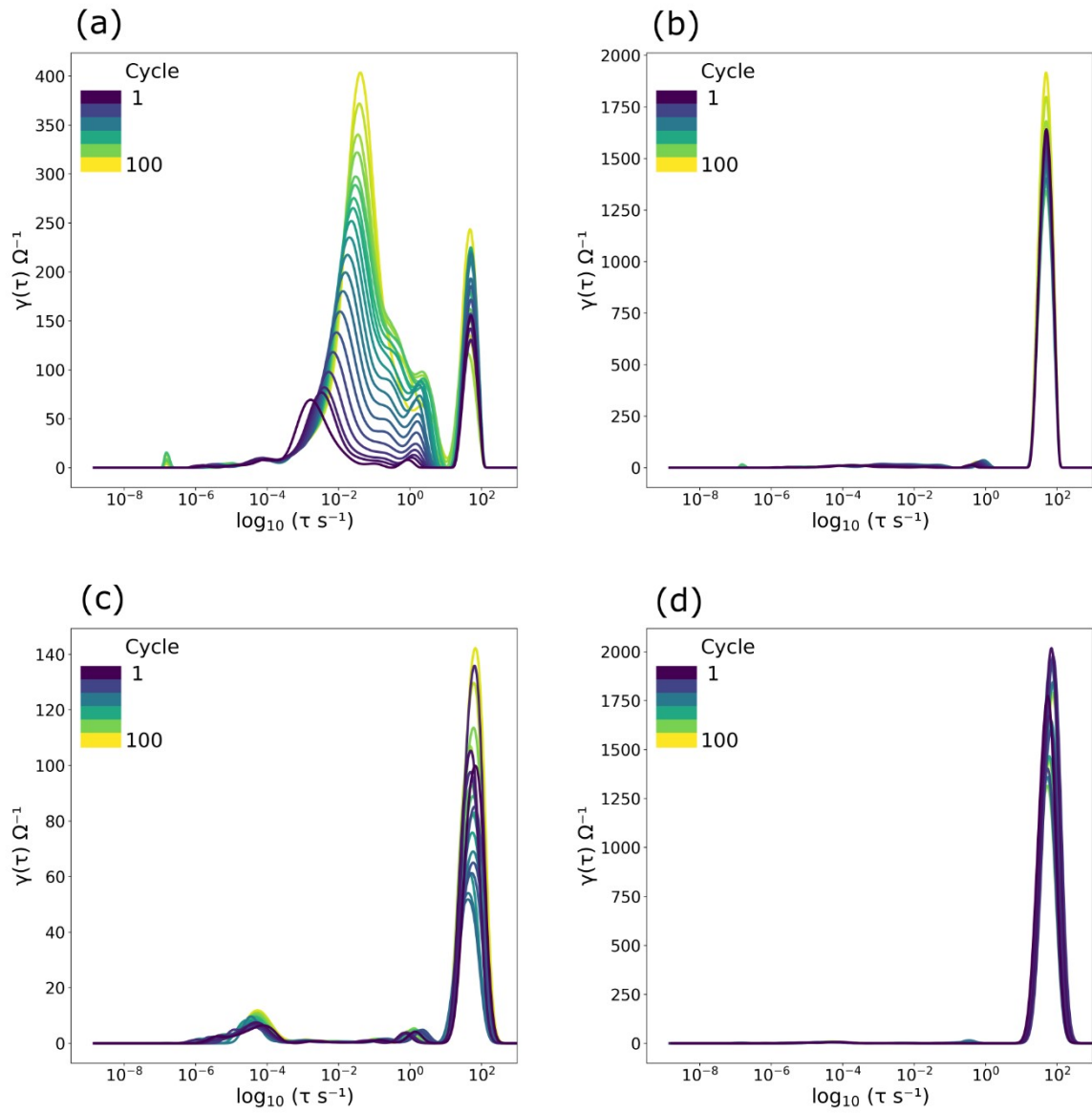


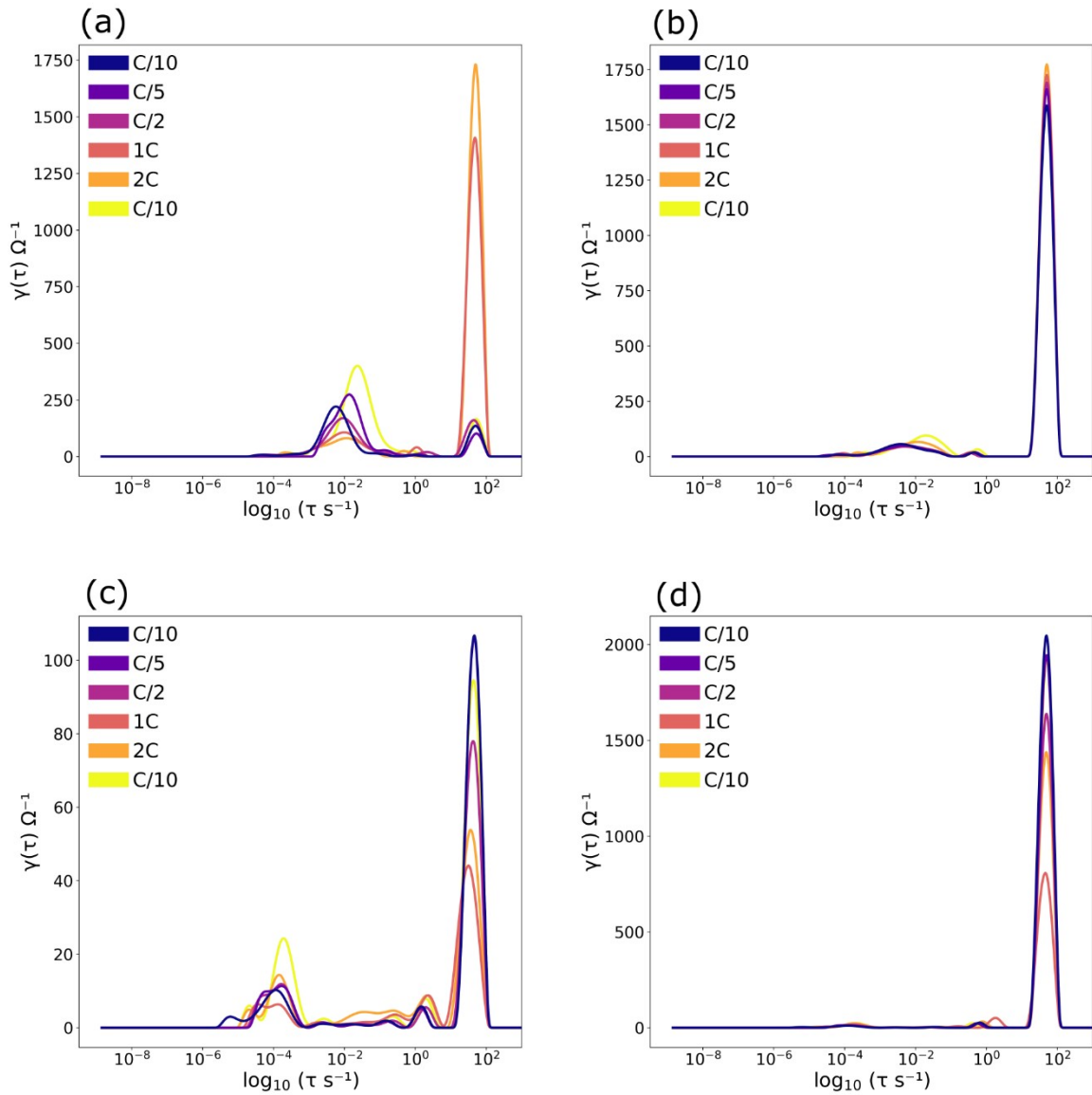
## Supplementary Information



**Figure 1:** The repeats of ungraded and graded composite cathodes in C/10 cycle life and rate capability measurements, with different colours indicating different repeats. Cycle life plots include two initial C/20 formation cycles. (a) ungraded cycle life (b) graded cycle life (c) ungraded rate performance (d) graded rate performance



**Figure 2:** EIS distribution of relaxation times (DRT) of graded and ungraded composite LFP/PEO cathodes against lithium metal. (a-d): EIS DRT spectra of graded and ungraded cathodes measured every 10th cycle at C/10 in either the charged or discharged state with (a) ungraded charged, (b) ungraded discharged, (c) graded charged, (d) graded discharged.



**Figure 3:** EIS distribution of relaxation times (DRT) of graded and ungraded composite LFP/PEO cathodes against lithium metal during rate performance. (a-d): EIS DRT spectra of graded and ungraded cathodes measured at each rate in either the charged or discharged state with (a) ungraded charged, (b) ungraded discharged, (c) graded charged, (d) graded discharged.