

Supporting information

XRD measurements were conducted on 40 nm TiO_2 samples deposited at different temperatures. Herein, we saw no additional diffraction peaks in samples deposited at higher chamber temperatures.

Crystallization to anatase and rutile phase are not expected at temperatures below 300°C and 900°C , respectively. As such we expect the amorphous phase to be preserved in both these films.

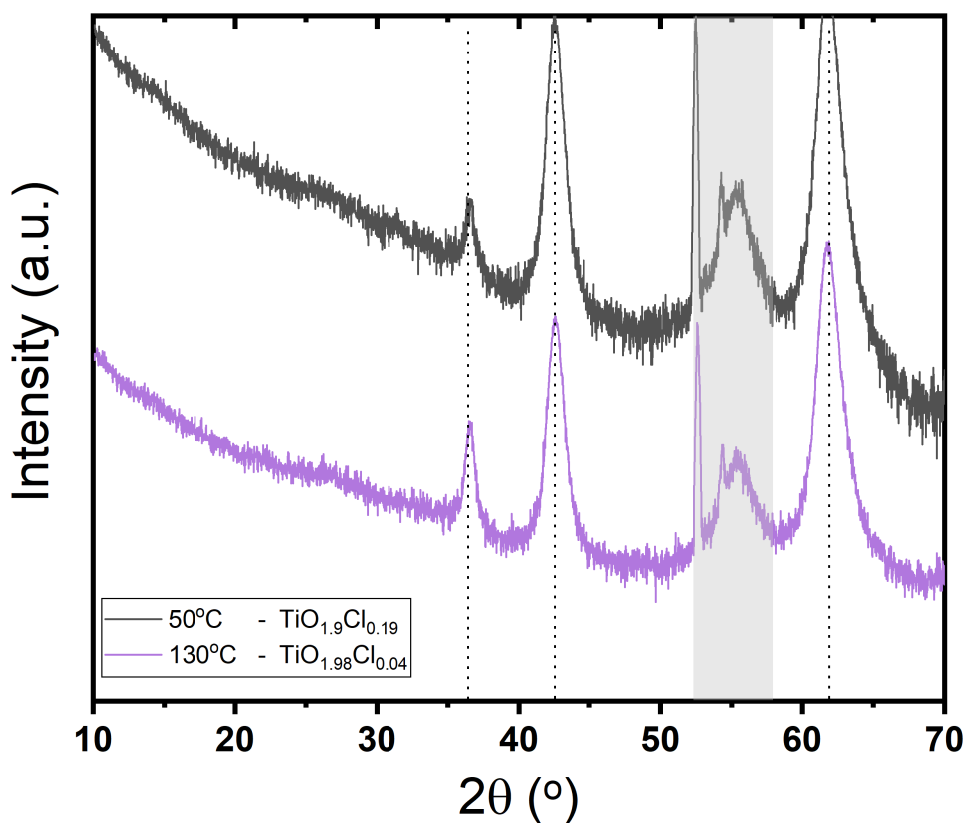


Figure 8: XRD diffraction patterns of 40 nm highly and lowly chlorine modified TiO_2 films deposited at 50°C and 130°C , respectively.

Figure 9 shows the Coulombic efficiency of all charge-discharge cycles shown in figure 4. The grey boxes indicate the cycles after a change in the charging rate. This value does not

reflect the actual charging efficiency, as it is influenced by the change in charging rate. An increase in the charging efficiency is primarily observed in the initial cycles of the reference measurement and the sample with a 1 nm coating, whereas any other samples have a more constant efficiency. The TiO_2/Cl samples show constant stability throughout the procedure. For the 3 nm TiO_2 coating, a strong variance is observed during the initial cycles, which is linked with the activation behaviour shown in figure 4c. Only after reaching a stable charge-discharge plateau, does the efficiency stabilize.

The trend observed in the final four cycles, namely where LMO with thicker coatings is more efficient, is observed throughout the whole procedure. Further, we see that at higher C-rates the charging efficiency is higher. This is the consequence of the reduced duration of the charge-discharge cycles. At elevated potentials, a parasitic oxidation current will flow. This current leads to an excess charge during the charging step and a charge loss during the discharging step. The total excess or loss scales with the duration of the (dis)charge step.

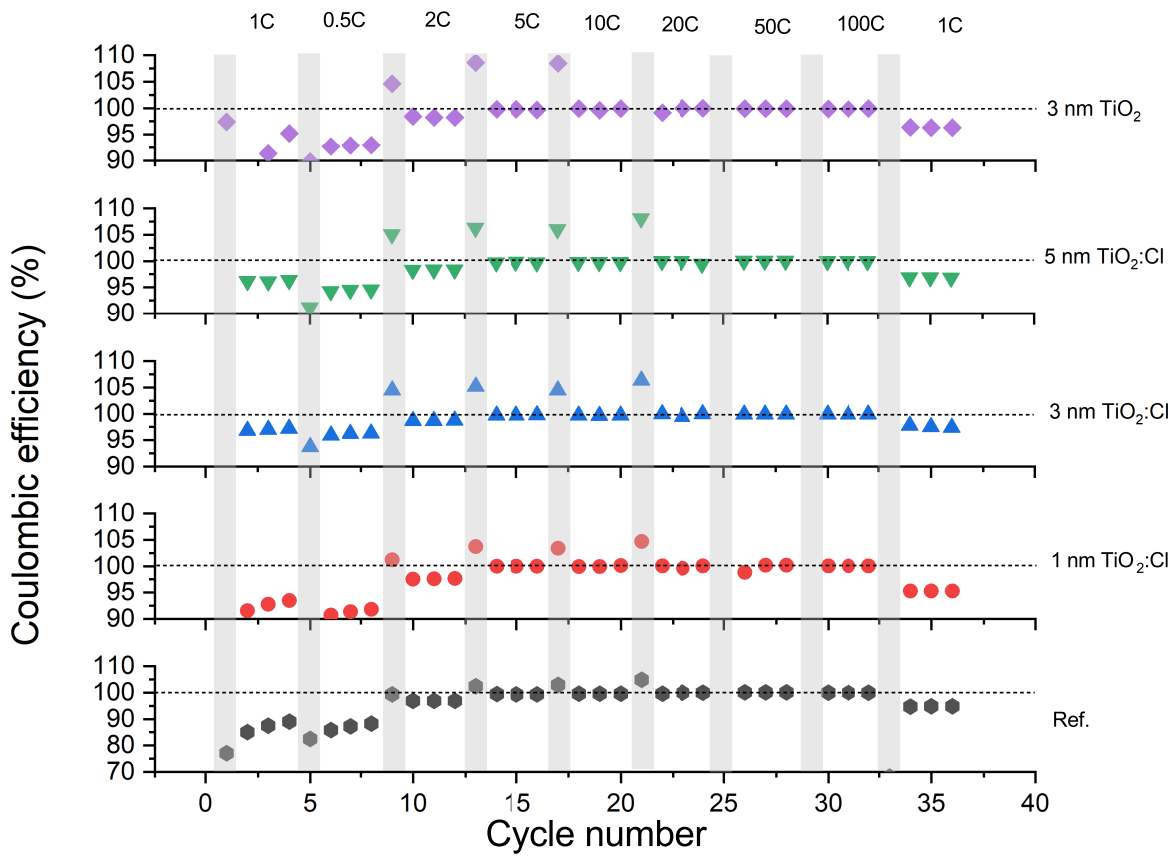


Figure 9: Coulombic efficiencies of all cycles measured in the charge-discharge procedure (Fig. 4).