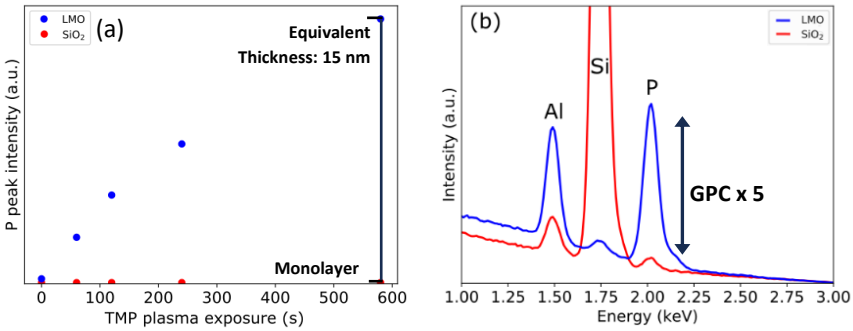

Figure 1. (a) P peak area on $LiMn_2O_4$ (LMO) and SiO_2/Si for varying **TMP plasma** exposure times showing self-limiting reactions on SiO_2 and continuous growth on LMO measured using EDX. (b) EDX spectra of LMO and SiO_2 coated with 30 ALD cycles of the TMP plasma process showing a much higher growth and more phosphorus rich layer on LMO.

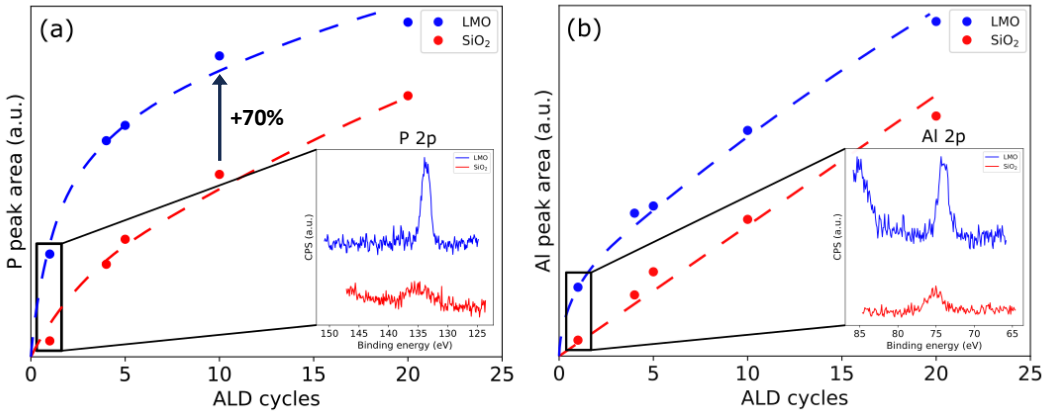

Figure 2. Peak area of (a) P 2p and (b) Al 2p peak area measured using in-vacuo XPS after various ALD cycles of the **TMP vapour** process on (red) a standard SiO_2 and (blue) a thin film LMO model system. Consistently higher peak areas are observed for both P and Al on LMO in the initial growth stage.

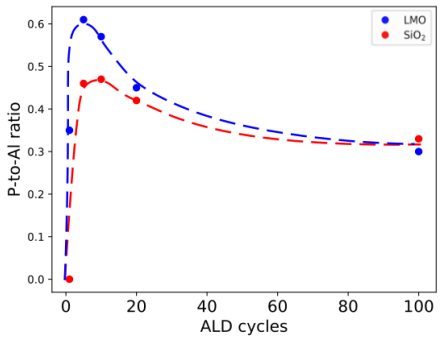

Figure 3. Concentration ratio of P-to-Al measured using XPS after various ALD cycles of **the TMP vapour** process on (red) a standard SiO_2 and (blue) a thin film LMO model system. A clear difference in coating composition is present during the initial ALD cycles (i.e. first 2-3 nm after 10 ALD cycles), which is the typical thickness range for most LIB electrode coatings.