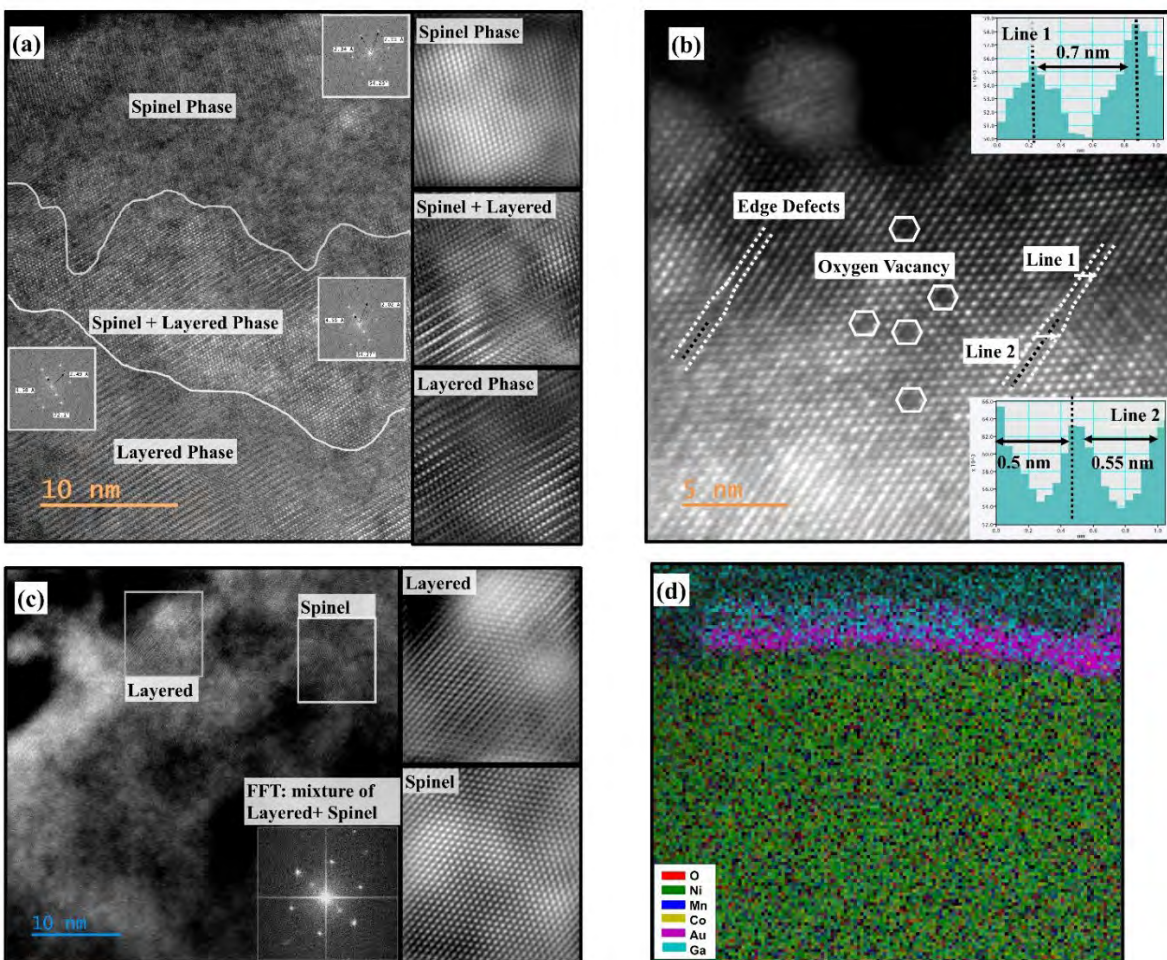
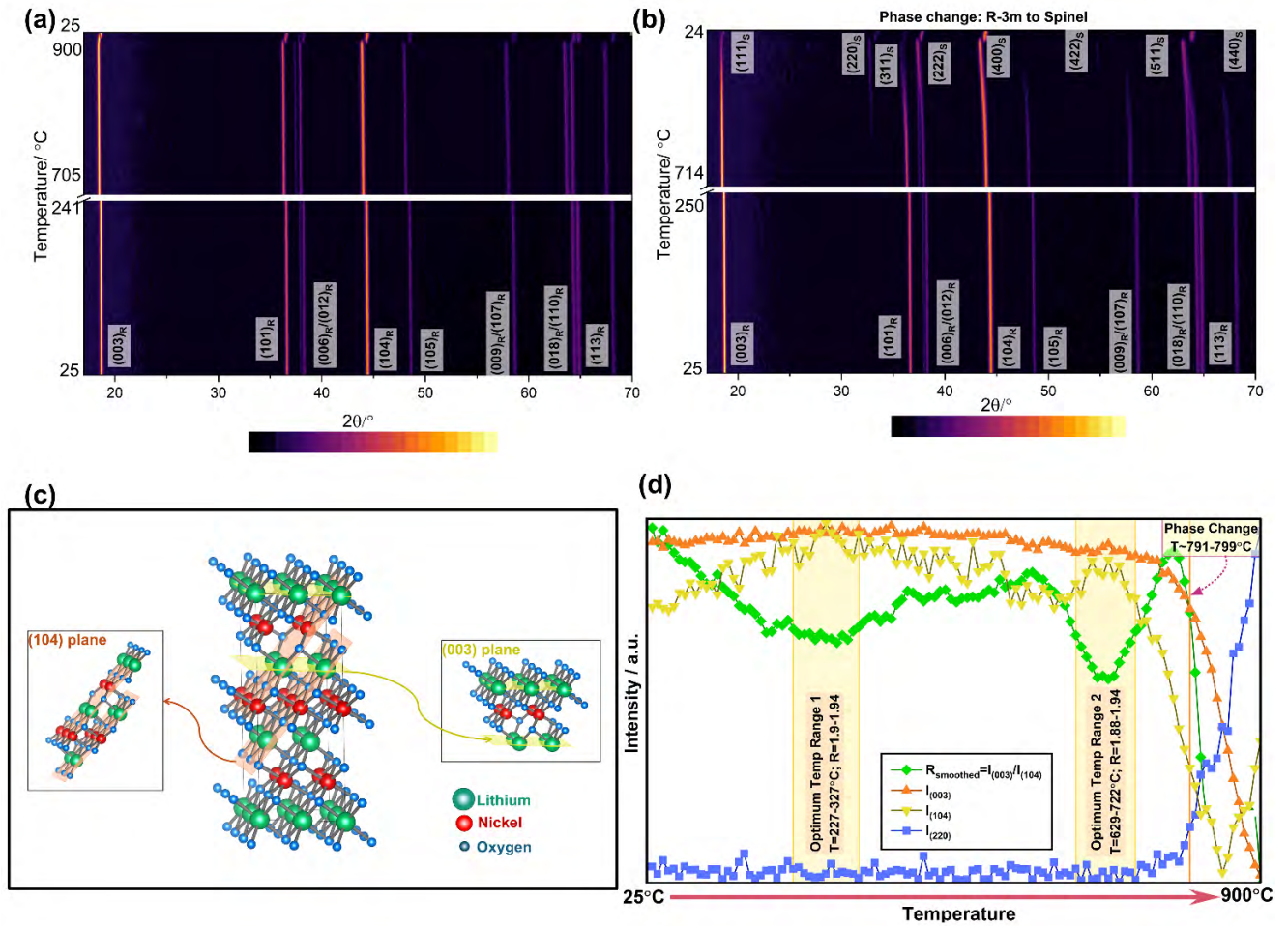


# Supplementary Document



**Figure 1: STEM image of (a) Modified NMC811 showing surface-to-core structure, (b) line defects and vacancies on the surface, (c) Pristine NMC811 with the FFT image showing a mixture of layered and spinel structure throughout the particles, (d) STEM-EDS showing minimal surface damage due to sample preparation.**



**Figure 2: In-situ annealing x-ray diffraction (XRD) measurement of NMC811 powder under (a) air and (b)  $N_2$  atmosphere at elevated temperatures. (c) Schematic representation of (003) plane (yellow) and (104) plane (orange) in LNO. (d) Optimum temperature range for NMC811 under  $N_2$  atmosphere comparing the (003) and (104) planar intensity. The intensity of the (220) plane serves as an indicator of bulk phase shift to spinel structure.**