Supplementary Data for **Addressing the High Coercive Field of ScxAl1-xN via Magnesium Doping in Molecular Beam Epitaxy**

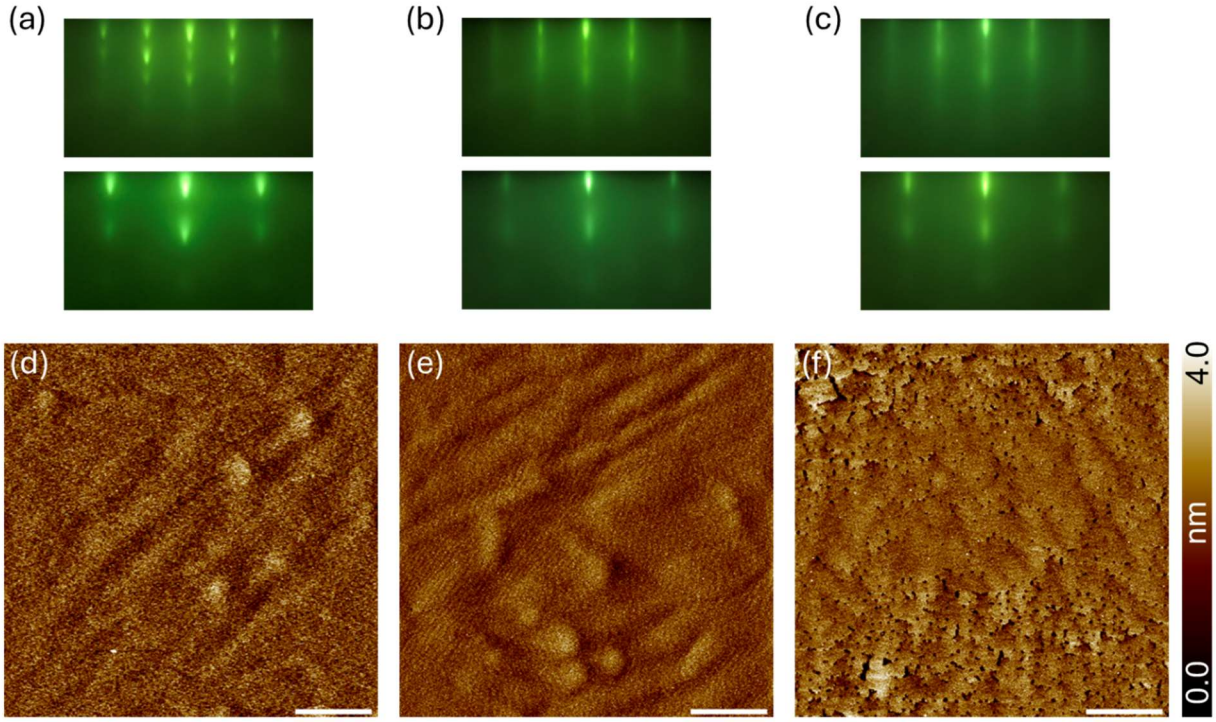

Figure 1. (a-c) [11$\bar{2}$0] and [10$\bar{1}$0] azimuth RHEED patterns, respectively, and (d-f) AFM images for $Sc_{0.2}Al_{0.8}N$. The lightly segmented nature of the RHEED patterns is typical for $Sc_{0.2}Al_{0.8}N$ growth. Doping with Mg does not appear to degrade the observed patterns. In (a, d), no Mg doping is used, while the Mg dopant cell temperatures are 360 °C in (b, e) and 400 °C in (c, f). The *rms* roughness is (a) 0.54 nm, (b) 0.44 nm, and (c) 0.54 nm. The scale bars represent 1 µm.

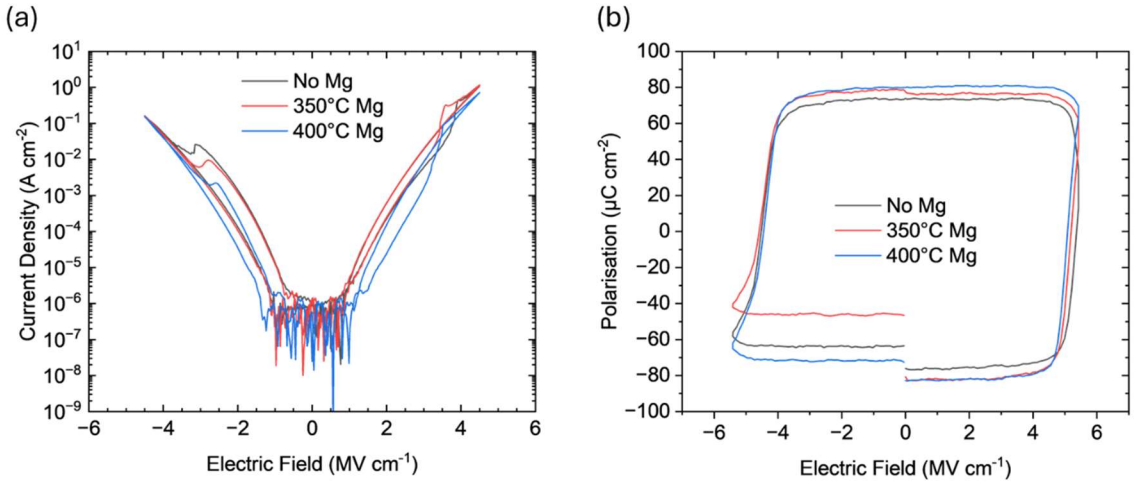

Figure 2. (a) Quasi-static J-E measurements, demonstrating a clear reduction in E_c with Mg doping. (b) Representative P-E loops measured using a 5 kHz triangular waveform, confirming ferroelectric behaviour via unambiguous hysteresis. Note that the reduction in E_c is not obvious from the P-E loops due to the high frequency of the measurement.