

Machine Learning Analysis and Predictions of PAMBE III–Nitride Growth

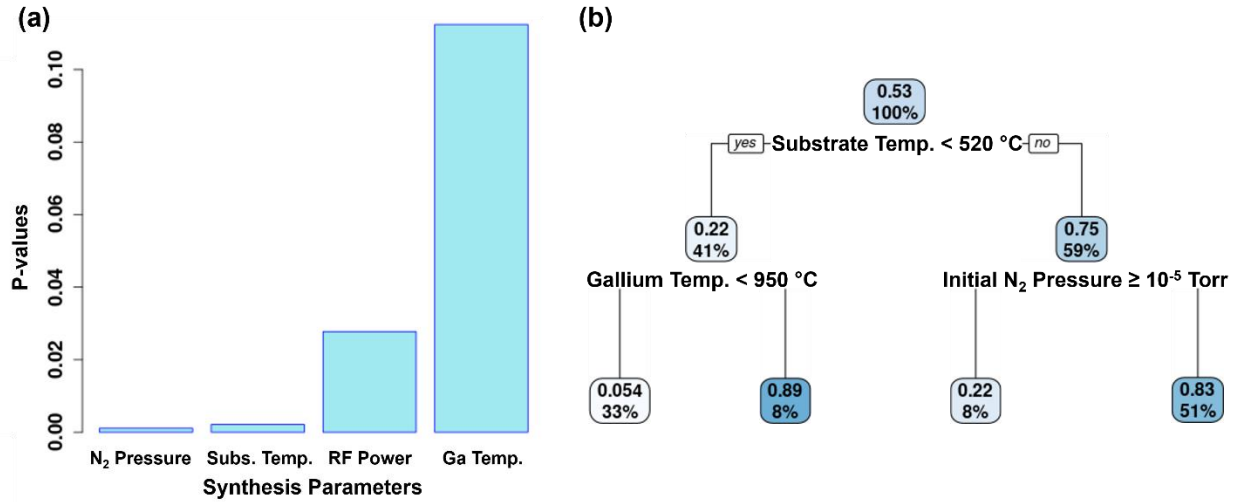


Figure 1: (a) P-values for GaN growth parameters – initial nitrogen pressure, substrate temperature, RF plasma source power, and gallium effusion cell temperature – measured with respect to the crystallinity value. (b) Decision tree fit to the GaN synthesis parameter data indicating the splitting rules which most accurately predict the crystallinity value in the GaN growth data.

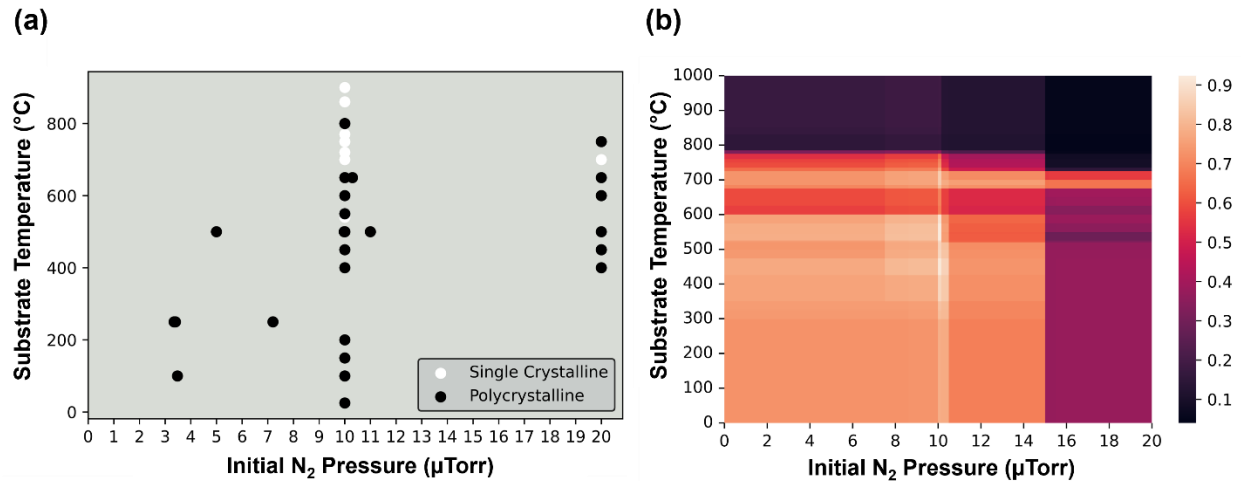


Figure 2: (a) Distribution of GaN training data points across a synthesis space of the two most statistically significant growth variables. (b) Class conditional probability value of a GaN sample growing as single crystalline as predicted by a random forest ensemble algorithm trained upon the growth data. During these predictions, the gallium effusion cell temperature was held constant at 960 °C and the RF plasma power was held constant at 350 W.