

Figure 1: A schematic representation of typical steady-state PEALD cycle (a) Precursor step where self-limiting adsorption of precursor molecules on the existing surface groups occur. (b) Purging step in which unwanted reaction byproducts and unreacted precursor molecules are removed. (c) Co-reactant step where removal of ligands from the surface of adsorbed precursor molecules by energetic plasma species occur. In addition, the re-establishment of original surface species is acquired. (d) The final purging step for removing reaction products. This results in a surface similar to the starting surface in (a) covered with a sub-monolayer of the material to be deposited. The cycle can be repeated as many times as desired to reach the targeted thickness. Reproduced from [1].

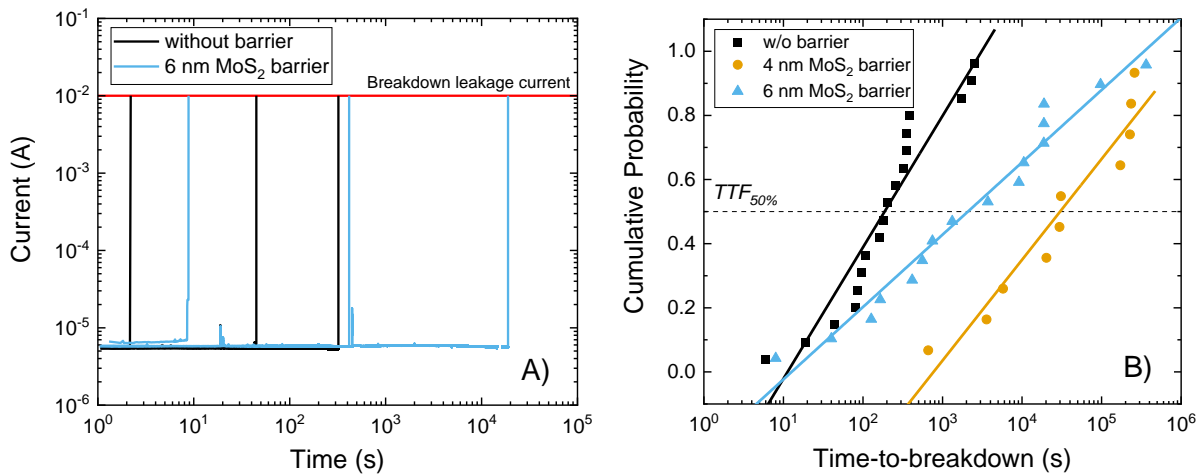


Figure 2: Time-dependent dielectric breakdown (TDDDB) results of samples without and with a MoS<sub>2</sub> barrier layer deposited at 450°C. A) Individual TDDDB measurements for two different samples, showing the current as a function of time. The red line indicates the breakdown leakage current. B) Cumulative probability plot for the time-to-breakdown for three different samples. The mean time-to-failure ( $TTF_{50\%}$ ) is used as a quantitative measure for the barrier performance.

[1] Sharma, A. Technische Universiteit Eindhoven (2018)