A low-voltage organic complementary inverter with high operation stability and flexibility using an ultrathin iCVD polymer dielectric and a hybrid encapsulation layer

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A low-voltage, air-stable, and flexible organic complementary inverter is demonstrated by incorporating a vapor-phase deposited polymer gate dielectric via initiated chemical vapor deposition (iCVD) and a hybrid encapsulation layer via iCVD and atomic layer deposition (ALD). The inverter exhibits a substantially high gain value of 130 V/V at a switching threshold voltage of 1.52 V and a supply voltage as low as 3 V. The device also exhibits high flexibility up to 2% tensile strain and long-term air stability.