Mist CVD Lab.

電機系 DEPARTMENT OF ELECTRICAL ENGINEERING

Our research team focuses on the following research topics:

Refinement of Mist CVD Technology

- Since most of our research relies on mist CVD technology, refining our facilities is important for achieving specific applications.

Ultra-wide band gap (UWBG) semiconductors

- Oxide-based ultrawide bandgap (UWBG) semiconductors like MgZnO, AlZnO, GaZnO, Ga_2O_3, and $(Al_xGa_{1-x})_2O_3$ belong to the 4th Gen. semiconductor. We aim to use these UWBG for high-power, high-voltage, and deep-UV optoelectronics applications.

Oxide-based synaptic transistors

- Synaptic transistors emulate brain computing through neuro-morphology. Our focus is on designing and fabricating low-power consumption oxide-based synaptic transistors to enable efficient computing.

Thin-film transistors (TFTs) overcoming mobility-stability trade-off

- Optimization of mobility and stability is an important topic in designing TFTs. Our goal is to utilize material and device structure design to overcome the trade-off between mobility and stability in oxide-based TFTs.

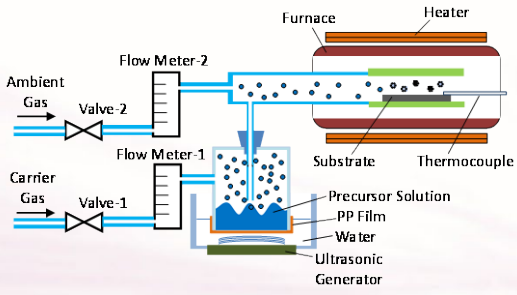

Fig. 1 Schematic mist CVD structure.

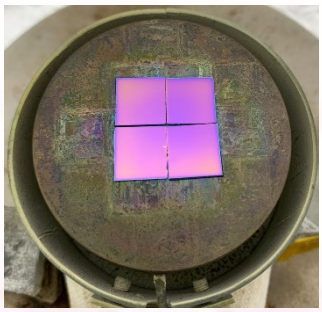

Fig. 2 Mist CVD-grown thin film on Si substrates.

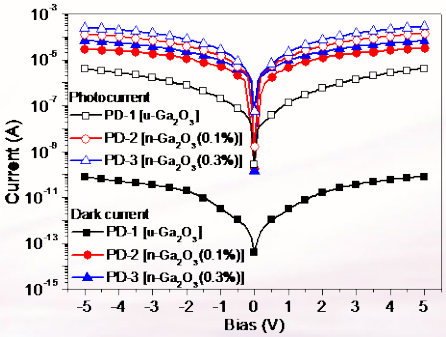

Fig. 3 Photoresponse characteristics of β-Ga_2O_3 with different Sn doping concentrations.

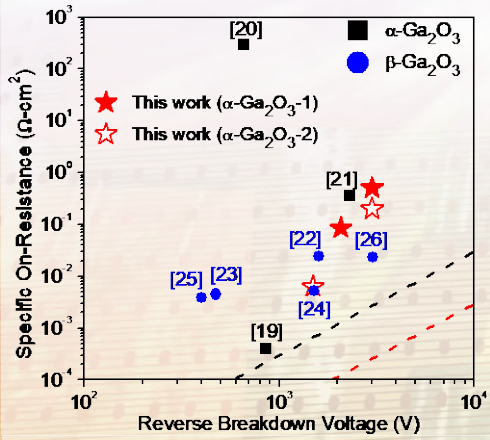

Fig. 4 Specific on-resistance versus breakdown voltage characteristics of α-Ga_2O_3 Schottky barrier diodes.

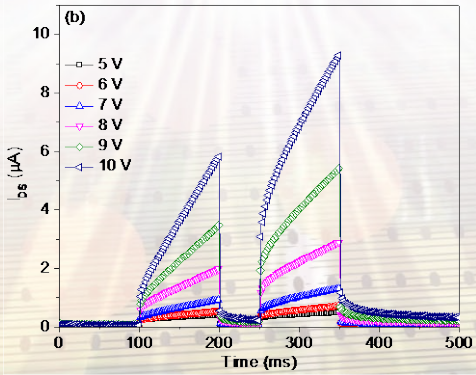

Fig. 5 Pair pulse facilitation (PPF) behaviors of our synaptic transistors.

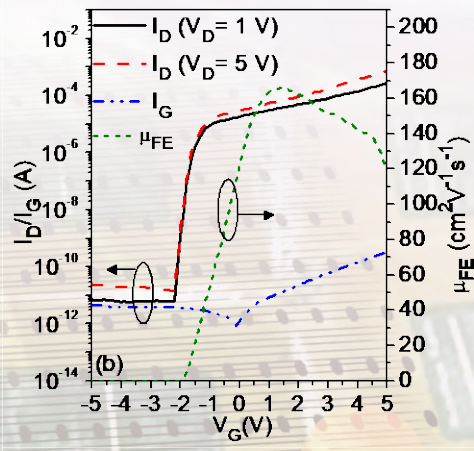

Fig. 6 High-mobility MgZnO/ZnO heterojunction thin-film transistor.

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