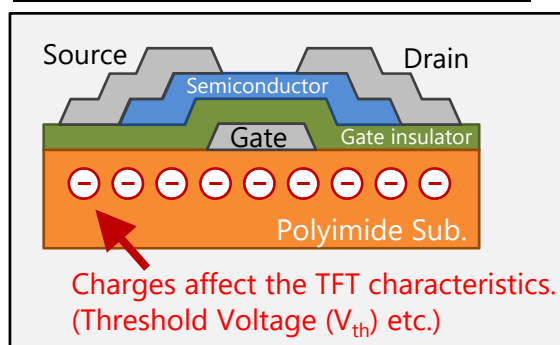


Charge analysis of flexible substrate materials using C-V method with mercury probe

Polyimide and other plastic materials are available in flexible substrate.
The charges in plastic substrate affect the TFT characteristics.
Here, we introduce charge analysis of polyimide film using C-V method with mercury probe.

Flexible substrate (polyimide)

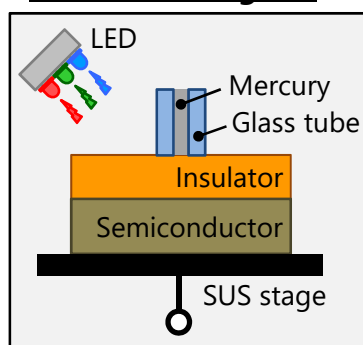
TFT(Thin Film Transistor) structure



- ✓ Cause of charges in substrate composition, dopant, process condition, light irradiation, electric field, etc.

Capacitance-Voltage method with mercury probe

Schematic diagram



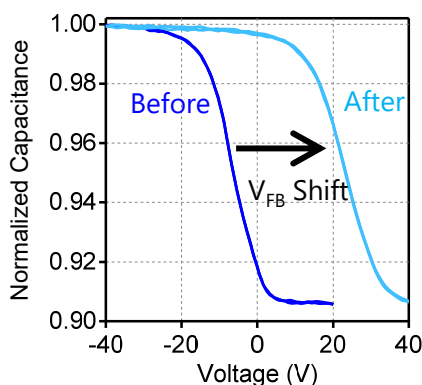
- ✓ Analysis of parameters
Effective charge density
Flatband voltage
Dielectric constant
etc...
- ✓ No need of electrode
- ✓ Available stress
Light irradiation(LED)
Electric field

Sample size: >50 mm sq.
Insulator thickness: <1~2 μm
Wafer resistivity: 1~100 $\Omega\cdot\text{cm}$
(depend on insulator thickness)

Example (Light irradiation C-V method)

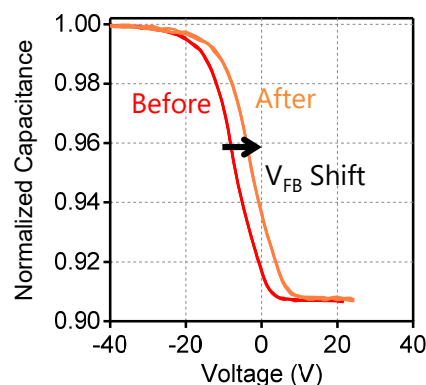
Light irradiation C-V ($\lambda=470\text{ nm}$)

(Power : 12 $\mu\text{W}/\text{cm}^2$, Time : 10 min)

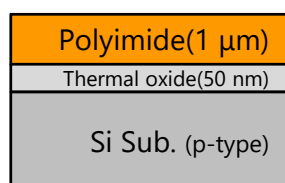


Light irradiation C-V ($\lambda=625\text{ nm}$)

(Power : 12 $\mu\text{W}/\text{cm}^2$, Time : 10 min)



Sample structure



- ✓ We provide charge evaluation of flexible substrate materials in various stress conditions.

		Irradiation wavelength	470 nm	625 nm
Flatband Voltage : V_{FB}	Before		-13.7 V	-14.2 V
	After		+13.7 V	-10.3 V
Effective charge density : N_{eff}	Before		+3.5E+11 cm^{-2}	+3.7E+11 cm^{-2}
	After		-3.8E+11 cm^{-2}	+2.6E+11 cm^{-2}