

**DEDICATED TO LORD SHIVA & SANKATMOCHANA
FOR THE SUPREMACY AND TO THE REDEEMER OF MY SOUL**

**DEDICATED TO MY FAMILY
FOR THEIR ENDLESS LOVE, SUPPORT, AND ENCOURAGEMENT**

**DEDICATED TO MY SUPERVISORS
FOR THEIR ENDLESS MOTIVATION, ENCOURAGEMENT, AND
TEACHING SKILLS**

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It is certified that the work contained in the thesis entitled "*Fabrication and Characterization of Organic Thin Film Transistors for Ammonia Sensing Application*" by "*Ankit Verma*" has been carried out under our supervision and that this work has not been submitted elsewhere for a degree.

It is further certified that the student has fulfilled all the requirements of Comprehensive Examination, Candidacy, and SOTA for the award of Ph.D. Degree.

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LIST OF ABBREVIATIONS

Abbreviation	Details
AFM	Atomic Force microscopy
OTFT	Organic Thin film transistor
FETs	Field-Effect Transistors
HOMO	Highest Occupied Molecular Orbital
LCAO	Linear Combination of Atomic Orbitals
LUMO	Lowest Unoccupied Molecular Orbital
MOS	Metal-oxide-semiconductor
MOSFET	Metal Oxide Semiconductor Field-Effect Transistor
OFETs	Organic Field-Effect Transistors
OLED	Organic Light-Emitting Diode
OLET	Organic Light-Emitting Transistor
P3HT	Poly(3-hexylthiophene)
PANI	Polyanilines
PBTTT-C14	Poly[2,5-bis(3-tetradecylthiophen-2-yl)thieno[3,2-b]thiophene]
PEDOT	Poly(3,4-ethylenedioxythiophene)
PEN	Polyethylene naphthalate
PET	Poly(ethylene terephthalate)
ppm	Part per million
ppp	Poly-para-phenylene
PPT	2,8-Bis(diphenyl phosphoryl)dibenzo[b,d]thiophene
PV	Polyphenylene Vinylene
PQT-12	Poly(3, 3''-dialkylquaterthiophene)
PT	Polythiophene
SEM	Scanning Electron Microscopy
SMU	Source and Measuring Unit
TEM	Transmission electron microscopy
TFT	Thin Film Transistor
UV-Vis	Ultraviolet-Visible
XRD	X-ray Diffraction

LIST OF SYMBOLS

Symbol	Abbreviation
E_G	Energy Bandgap
E_C	Bottom of the Conduction Band
E_V	Bottom of the Valence Band
α	Absorption Coefficient
C_{ox}	Capacitance per unit area of Insulator
CV	Capacitance-Voltage
L	Channel Length of Transistor
W	Channel Width of Transistor
R^2	Correlation Coefficient
ϵ_r	Dielectric Permittivity of SiO_2
I_{DS}	Drain to Source Current
V_{DS}	Drain to Source Voltage
E_F	Fermi Energy Level
S	Gas Response
V_{GS}	Gate to Source Voltage
P	Incident Optical Power
μ	Mobility
E_0	Neutral Level
t_{ox}	Oxide Gate Thickness
SS	Subthreshold Swing
V_{th}	Threshold Voltage
g_m	Transconductance
Λ	Wavelength
