VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"Jnana Sangama" Belagavi – 590 018

PROJECT REPORT ON

"DEVELOPMENT OF ZnO-PANI COMPOSITE BASED AMMONIA SENSOR"

Submitted in partial fulfillment of the requirements for the award of degree

BACHELOR OF ENGINEERING
IN
ELECTRONICS & COMMUNICATION ENGINEERING

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MOODBIDRI – 574 225.
Accredited by NBA & NAAC with A+ Grade

2023-2024

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(Affiliated to VTU, BELAGAVI)

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CERTIFICATE

*Certified that the project work entitled "***DEVELOPMENT OF ZnO-PANI COMPOSITE BASED AMMONIA SENSOR***" is a bona fide work carried out by*

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in partial fulfillment for the award of **BACHELOR OF ENGINEERING** in **ELECTRONICS & COMMUNICATION ENGINEERING** of the **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI** during the year 2023–2024. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies theacademic requirements in respect of Project work prescribed for the Bachelor of Engineering Degree.

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ABSTRACT

Ammonia sensors are vital components across industries, ensuring safety, efficiency, and quality in industrial, environmental, and agricultural applications. This study introduces a novel method to produce highly sensitive ammonia sensors using polymer blend films. Through a solution blending approach, stable free-standing films with tailored properties are fabricated, characterized by various techniques to understand their electronic states and potential for enhanced sensor performance.

These polymer blend films serve as the basis for resistive-based ammonia sensors, displaying a linear response to changes in ammonia concentration with minimal hysteresis. Even after prolonged exposure to ammonia cycles, the sensors maintain stability, demonstrating reliability in real-world scenarios. Furthermore, the study investigates the impact of environmental conditions and operational stresses on sensor performance to enhance reliability and longevity.

Comprehensive testing and analysis evaluate the robustness and durability of the developed sensor technology under diverse conditions, including temperature fluctuations, humidity levels, and mechanical stress. The results highlight the resilience of the polymer blend films, maintaining consistent performance in challenging environments. By identifying potential failure points and implementing preventive measures, the study enhances the reliability and effectiveness of ammonia sensing systems for long-term utilization across industrial, environmental, and agricultural sectors.