UNIVERSITI TEKNOLOGI MARA
CAWANGAN PULAU PINANG

IMPLEMENTATION OF COLORIMETER SENSING SYSTEM FOR ANALYZING DEGRADATION OF CHLORINE MEASUREMENT

MUHAMMAD UWAIS AIMAN BIN HAMZAH

BACHELOR OF ENGINEERING (HONS)
ELECTRICAL AND ELECTRONIC ENGINEERING

February 2025

AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations, Universiti Teknologi MARA, regulating the conduct of my study and research.

Name of Student	:	Muhammad Uwais Aiman Bin Hamzah
Student I.D. No.	:	202278(
Programme	:	Bachelor of Engineering (HONS) Electrical and Electronics Engineering (CEEE200).
Faculty	:	Electrical Engineering Studies
Thesis	:	Implementation of Colorimeter Sensing System for Analyzing Degradation of Chlorine Measurement.
Signature of Student	:	.....
Date	:	February 2025

ABSTRACT

This study focuses on the implementation of a colorimeter-based sensing system for analyzing the degradation of chlorine concentration in water. Chlorine is a widely used disinfectant in water treatment, but its effectiveness diminishes over time due to environmental and chemical factors. Traditional methods for monitoring chlorine levels are often labor-intensive, time-consuming, and reliant on expensive laboratory equipment, making them unsuitable for real-time applications. To address these challenges, a low-cost and reliable colorimeter sensing system was created and calibrated using known chlorine concentrations. Static experiments were conducted to monitor chlorine degradation over a 10-minute interval, with absorbance and concentration data recorded and analyzed. The collected data was used to plot degradation graphs and apply the first-order kinetic law to determine the reaction rate, providing insights into the behavior and stability of chlorine in water. The results demonstrated the effectiveness of the system in accurately measuring chlorine concentration and its degradation over time. This project offers a cost-effective and portable solution for real-time chlorine monitoring, with potential applications in water treatment facilities, environmental monitoring, and public health management. The study contributes to the advancement of water quality monitoring by providing a practical and efficient tool for understanding chlorine degradation dynamics.

ACKNOWLEDGEMENT

I would like to express my sincere gratitude to people that have helped me in the completion of this thesis. Firstly, I want to express my appreciation to my supervisor for this project, Dr. Mohamad Faizal bin Abd Rahman, who has guide me and give an unwavering support throughout this research journey. Your idea, patience and feedback have helped me to make the project to a completion.

I would like to appreciate Universiti Teknologi MARA Cawangan Permatang Pauh for equipping me with the finest of resources and support system which enables me to study and carry out research here.

I greatly acknowledge the constant encouragement and support, sometimes with immense patience from my family and friends at trying times throughout this academic trail. This is what kept me going throughout such difficult and challenging trying times in undertaking this study.

Finally, I would like to thank all the authors whose work and ideas are included in this thesis. Their work and contributions enormously contributed to the depth and scope of my research work.

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