

**MODIFICATION ON THE CATALYTIC
PROPERTIES OF CuCe MIXED METAL
OXIDES CATALYST FOR REMOVAL OF
CO_x: A REVIEW**

**MUHAMMAD FADLI HANAFI BIN ABDUL
RAIS**

**BACHELOR OF CHEMICAL ENGINEERING
(ENVIRONMENT) WITH HONOURS**

UNIVERSITI TEKNOLOGI MARA

2022

**MODIFICATION ON THE CATALYTIC PROPERTIES OF
CuCe MIXED METAL OXIDE FOR REMOVAL OF CO_x: A
REVIEW**

BY

MUHAMMAD FADLI HANAFI BIN ABDUL RAIS

This report is submitted in partial fulfillment of the requirements
needed for the award of
Bachelor of Chemical Engineering (Environment) with Honours

**CENTRE FOR CHEMICAL ENGINEERING STUDIES
UNIVERSITI TEKNOLOGI MARA**

AUG 2022

ACKNOWLEDGEMENT

I would like to express my deepest appreciation to all those who provided me with the possibility to complete this Final Year Project report. A special gratitude I give to my supervisor, Dr Siti Aminah Md Ali whose contribution in stimulating suggestions and encouragement, guidance, constant supervision as well as her support to me during completing this report.

Furthermore, I would like to acknowledge with much appreciation of the crucial role of my family member for their kind cooperation and encouragement which help me to complete this report.

Finally, I would like to express my gratitude and thanks to my final year project coordinator, Ir. Dr. Noorzalila Muhammad Niza for giving me such helpful guidance, attention, and time during this semester.

TABLE OF CONTENTS

	PAGE
AUTHOR'S DECLARATION	i
SUPERVISOR'S CERTIFICATION	ii
COORDINATOR'S CERTIFICATION	iii
ACKNOWLEDGEMENT	iv
TABLE OF CONTENTS	v
LIST OF TABLES	vii
LIST OF FIGURES	viii
LIST OF ABBREVIATIONS	ix
ABSTRACT	x
CHAPTER ONE INTRODUCTION	1
1.1 Research Background	1
1.2 Problem Statement	2
1.3 Objectives	4
1.4 Scope of Work	4
CHAPTER TWO LITERATURE REVIEW	5
2.1 Copper (II) Oxide, CuO	5
2.1.1 Copper (II) Oxide in general	5
2.1.2 Main properties of copper (II) oxide	6
2.2 Cerium Oxide	6
2.2.1 Properties of cerium oxide, CeO ₂	7
2.3 Effect of calcination temperature on catalytic performance	8
2.4 Effect of chemical doping	8
2.5 Effect of impregnation method	9
CHAPTER THREE RESEARCH METHODOLOGY	10
3.1 Introduction	10
3.2 Research Flowchart	10

ABSTRACT

Carbon monoxide (CO) is a widely distributed byproduct of incomplete combustion of carbon-containing fuels. The amount of oxygen that can be transported to essential organs like the heart and brain through the bloodstream is limited when breathing CO-rich air. At very high levels of CO, which are achievable indoors or in other confined spaces, it can cause dizziness, confusion, coma, and death. To remove COx, several ways for removing COx have been investigated, one of which is the selective catalytic process. The modification on the catalytic properties such as the effect of calcination temperature of CuCe catalyst, the effect of chemical doping and the effect of impregnation method very important because it will change the performance of CuCe mixed metal catalyst for removal of COx. Many journals have been read and analyse to know which method is the best for modified catalytic properties on CuCe mixed metal catalyst. In conclusion, the effect of chemical doping on CuCe for removal of COx is the best technique than effect of calcination temperature and effect of impregnation method.