

**TABLE OF CONTENTS**

RATIFICATION PAGE	iii
STATEMENT PAGE	iv
PREFACE	v
TABLE OF CONTENTS	vi
LIST OF FIGURES	viii
LIST OF TABLES	x
LIST OF APPENDICES	xi
ABSTRACT	xii
INTISARI	xiii
CHAPTER I INTRODUCTION	1
I.1 Background	1
I.2 Objectives	3
I.3 Benefits	3
CHAPTER II THEORETICAL BACKGROUND AND HYPOTHESIS FORMULATION	4
II.1 Theoretical Background	4
II.1.1 Chitosan based polymer electrolyte	4
II.1.2 ZnO nanofiller in polymer electrolyte	6
II.2 Hypothesis Formulation and Research Design	11
II.2.1 Hypothesis formulation I	11
II.2.3 Hypothesis formulation II	11
II.2.4 Research Design	12
CHAPTER III RESEARCH METHOD	13
III.1 Materials and Equipment	13
III.1.1 Materials	13
III.1.2 Equipment	13
III.2 Procedure	13
III.2.1 Synthesis of ZnO nanoalmonds	13
III.2.2 Synthesis of ZnO nanorods	13
III.2.3 Preparation of chitosan polymer electrolyte	14
III.2.4 Instrumentation	14
CHAPTER IV RESULTS AND DISCUSSION	16
IV.1 Synthesis of ZnO Nanorods and Nanoalmonds	16
IV.1.1 Synthesis of ZnO nanorods	16
IV.1.2 Synthesis of ZnO nanoalmonds	21
IV.2 Chitosan/ZnO Nanofiller Polymer Gel Electrolyte Characterization	27
IV.2.1 FTIR analysis of chitosan-based electrolyte	27
IV.2.2 Cyclic voltammetry analysis of chitosan-based electrolyte	31
IV.2.3 SEM analysis of chitosan-based electrolyte	44
IV.2.4 XRD analysis of chitosan-based electrolyte	46



UNIVERSITAS
GADJAH MADA

Enhanced Electrochemical Properties of ZnO Nanoparticles Incorporated Polymer Gel Electrolyte For The Application Of Dye Sensitized Solar Cells

Adella Vega Aulia Shafa, Adhi Dwi Hatmanto, S.Si., M.Sc., Ph.D; Prof. Indriana Kartini, S.Si., M.Si., Ph.D

Universitas Gadjah Mada, 2024 | Diunduh dari <http://etd.repository.ugm.ac.id/>

IV.2.5 Redox reversibility and electron transfer scheme in DSSC	47
CHAPTER V CONCLUSIONS AND SUGGESTIONS	50
V.1 Conclusions	50
V.2 Suggestion	50
REFERENCES	51
APPENDIX	55