

**SYNTHESIS AND CHARACTERISATION OF
TIN-BASED MIXED OXIDES**

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**INSTITUTE OF POSTGRADUATE STUDIES AND RESEARCH
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In the name of God, Most Gracious, Most Merciful.

“verily never will God change the condition of a people until they change it themselves (with their own souls)”

- Al-Quran.

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ABSTRAK

Kajian ini melaporkan penyediaan stanum dioksida, stanum monoksida dan oksida campuran yang berasaskan stanum dengan menggunakan tindakbalas suhu rendah dan tindakbalas biasa keadaan pepejal. Stanum dioksida sebagai bahan separa amorfus disediakan dengan melarutkan stanum diklorida dihidrat dalam air untuk menghasilkan gel stanum dioksida tanpa penambahan agen pemendakan. Kadar pembentukan gel dipengaruhi oleh kepekatan larutan timah, masa pengacauan dan suhu. Stanum monoksida berhablur disediakan secara memanaskan larutan stanum diklorida dan menambahkan larutan ammonium hidroksida secukupnya. Pembentukan pemendakan ini dipengaruhi oleh masa pengacauan, suhu dan kuantiti ammonium hidroksida. Kedua-dua stanum dioksida dan stanum monoksida digunakan sebagai reagen pemula untuk penyediaan vanadium stanum oksida dan litium stanum oksida; pencirian bahan dijalankan dengan keadah XRD, DTA, TGA dan FTIR.

ABSTRACT

This work reports the preparation of tin dioxide, tin monoxide and tin-based mixed oxides using low-temperature and conventional solid-state reactions. The tin dioxide was prepared as a semi-amorphous material, by dissolving tin dichloride dihydrate in water, which gives a gel of tin dioxide without the addition of a precipitating agent. The concentration of tin in the solution, stirring time and the temperature affect the rate of formation of the gel. The tin monoxide is prepared as a crystalline material by briefly heating a solution of tin dichloride and then adding an appropriate amount of ammonium hydroxide to this solution. The stirring time, temperature and the quantity of ammonium hydroxide influence the formation of the precipitate. Both tin dioxide and tin monoxide are used as starting reagents for the preparation of vanadium tin oxide and lithium tin oxide. The materials have been characterised by XRD, DTA, TGA and FTIR methods.

CONTENTS

ACKNOWLEDGMENTS	i
ABSTRAK	ii
ABSTRACT	iii
TABLE OF CONTENTS	iv

Chapter 1

Introduction	1
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Chapter 2

Experimental techniques

2.1	Introduction	5
2.2	Methods of synthesis of oxide materials	6
	2.2.1 Solid-state reactions	6
	2.2.2 Soft chemistry method	7
2.3	Techniques for the characterisation of metal oxides	11
	2.3.1 Introduction	11
	2.3.2 X-ray diffraction and the powder diffraction	11
	2.3.3 Thermal techniques	13
	2.3.3.1 Thermogravimetric Analysis (TGA)	14
	2.3.3.2 Differential Scanning Calorimetry (DSC)	15
	2.3.3.3 Differential Thermal Analysis (DTA)	15

2.3.4 FT Infrared spectroscopy (FTIR)	16
2.3.5 Electron microscopy	16

Chapter 3

Synthesis and characterisation of tin dioxide and tin monoxide

3.1	Introduction	18
3.2	Synthesis of tin dioxide	19
3.3	Factors influencing the gel formation	21
	3.3.1 Concentration of tin dichloride in water	21
	3.3.2 Temperature of reaction	22
	3.3.3 Stirring time	23
3.4	Characterisation of tin dioxide	25
	3.4.1 X-ray diffraction	25
	3.4.2 Thermal analysis	28
	3.4.2 SEM photographs of the gel	30
	3.4.3 Fourier Transform Infrared spectroscopy	33
3.5	Synthesis of tin monoxide (SnO)	35
3.6	Factors influencing the preparation of tin monoxide	35
	3.6.1 Temperature	36
	3.6.2 Stirring time	36
	3.6.3 Ammonium hydroxide	36

3.7	Characterisation of tin monoxide	37
3.7.1	X-ray Diffraction	37
3.7.2	Thermal analysis	39
3.7.3	SEM Photographs of tin monoxide	41
3.7.4	Transformation from tin monoxide to tin dioxide	41

Chapter 4

Discussion on tin dioxide and tin monoxide

4.1	Discussions on tin dioxide	46
4.2	Discussions on tin monoxide	50
4.3	Discussion on the transformation of tin monoxide to tin dioxide	51

Chapter 5

Synthesis and characterisation of lithium tin oxide and vanadium tin oxide

5.1	Synthesis of lithium tin oxide	52
5.2	Characterisation of lithium tin oxide obtained from tin dioxide and lithium hydroxide	53
5.2.1	X-ray diffraction	53
5.2.2	SEM photograph	55

5.2.3	Thermal analysis	60
5.2.4	FTIR	63
5.3	Characterisation of Lithium tin oxide obtained from tin monoxide and lithium hydroxide	66
5.3.1	X-ray diffraction	66
5.3.2	Thermal analysis	69
5.3.2	FTIR	72
5.4	Alternative method for the preparation of lithium tin oxide and X-Ray characterisation	75
5.5	Synthesis of vanadium tin oxide	77
5.6	Characterisation of vanadium tin oxide	79

Chapter 6

Discussions on lithium tin oxide and vanadium tin oxide

6.1	Discussions on lithium tin oxide obtained from tin dioxide and lithium hydroxide	81
6.2	Discussion on lithium tin oxide obtained from tin monoxide and lithium hydroxide	83
6.3	Discussion on vanadium tin oxide	85
6.4	Summary	88

Chapter 7

General conclusions and suggestions for further work

General conclusions	90
Suggestion for further works	91
References	93