

**FEASIBILITY STUDIES ON THE
PURIFICATION AND APPLICATION OF
INDIGENOUS RAW MATERIALS
FOR THE PRODUCTION OF CERAMICS**

PhD DISSERTATION

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ABSTRACT

The characterization of locally available raw materials such as Ball Clay, China Clay, Feldspar, Quartz and Dolomite were studied by using physical tests, chemical analysis and energy dispersive X-ray fluorescence spectrometry (EDXRF) method.

These raw materials were used in the fabrication of ceramics such as semi-porcelain products and tiles based on the "Classic Tri-axial Phase System". The physico-chemical properties of materials such as density, viscosity, green strength, glost strength, plasticity, drying shrinkage, firing shrinkage, color and water absorption were studied during the process.

It was found that some Myanmar raw materials contain impurities especially oxides of iron ranging from 0.5 to 6 percent. The iron compounds give to the products a color from cream to red on firing in an oxidizing atmosphere. If fired in a reducing atmosphere, iron compounds give to the body from a light grayish color to dark gray color depending on their content. White-burning clays contain less than one percent of iron oxide. The presence of iron was considered as a big problem for ceramics production.

The oxides of iron were removed from clays and feldspar by using acids such as hydrochloric acid and sulphuric acid. The optimum condition of purification process was studied by using different strengths of both acids. 5M sulphuric acid can remove the highest amount of iron and thus it can give the whitest color product in each and every case.

The purified raw materials were used for the preparation of body, glaze and engobe in ceramics production. The qualities of resultant ceramic products were studied and compared with those of the products made from untreated raw materials.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	i
ABSTRACT	iii
CONTENTS	v
LIST OF TABLES	x
LIST OF FIGURES	xiii
Chapter I	
1 INTRODUCTION	1
Chapter II	
2 LITERATURE REVIEW	11
2.1 Semi-porcelain Ware	11
2.1.1 The Manufacturing Process of Semi-porcelain Ware	13
2.1.1.1 Drying	14
2.1.1.2 Burning	14
2.1.1.3 Kilns	16
2.1.1.4 Glazing	19
2.2 Tiles	21
2.2.1 The Manufacturing Process of Tiles	22
2.2.2 Glaze and Engobe	23
2.2.2.1 Glaze Compositions	24
2.3 Effects of Raw Materials on Glaze	28
2.3.1 Silica	28
2.3.2 Boric oxide	29

	Page
2.3.3 Alumina	29
2.3.4 Magnesia	30
2.3.5 Lead oxide	30
2.3.6 Potash Feldspar	31
2.3.7 Soda Feldspar	31
2.4 Myanmar Raw Materials for Ceramics	31
2.4.1 China Clay	32
2.4.2 Ball Clay	32
2.4.3 Feldspar	34
2.4.4 Quartz	35
2.4.5 Dolomite	36
2.4.6 Lime	37
2.4.7 Other Raw Materials	38
2.5 Analysis of Ceramic Raw Materials	39
2.5.1 Chemical Analysis	39
2.5.1.1 The Constituents to be Determined	39
2.5.1.2 Drying of Samples	40
2.5.2 Energy Dispersive X-Ray Fluorescence Spectrometry (EDXRF) Method	40
2.6 Iron Compounds Present in Raw Materials	40

Chapter III

MATERIALS AND METHODS

3	Experimental Procedures	42
3.1	Raw Materials and Sampling	42

	Page
3.2 Chemical Analysis of Local Raw Materials	42
3.2.1 Chemical Analysis of China Clay (ST)	42
3.2.1.1 Determination of Moisture Content	42
3.2.1.2 Determination of Loss on Ignition (LOI)	43
3.2.1.3 Determination of Silica	43
3.2.1.4 Determination of R_2O_3	44
3.2.1.5 Determination of Iron as Iron (III) Oxide	45
3.2.1.6 Determination of Alumina	46
3.2.1.7 Determination of Calcia	46
3.2.1.8 Determination of Magnesia	47
3.2.1.9 Determination of Alkali Metals	48
3.2.2 Chemical Analysis of Other Local Raw Materials	49
3.3 Determination of Physical Properties of Raw Materials	49
3.3.1 Physical Properties of China Clay (ST)	49
3.3.1.1 Measurement of Shrinkage	49
3.3.1.2 Measurement of Drying Shrinkage	50
3.3.1.3 Measurement of Firing Shrinkage	51
3.3.1.4 Determination of Water Absorption	52
3.3.1.5 Determination of Green Strength	54
3.3.1.6 Determination of Glost Strength	56
3.3.1.7 Determination of Water Content	56
3.3.1.8 Determination of Plasticity	57

	Page
3.3.2 Determination of Refractoriness of Feldspar	58
3.3.3 Determination of Physical Properties of Quartz	59
3.4 Mineralogical Analysis of Raw Materials	59
3.4.1 EDXRF Method	59
3.5 Preparation of Semi-porcelain Test-pieces Using Raw Materials Without Purification	61
3.5.1 Preparation of Raw Materials	61
3.5.2 Preparation of Slip	61
3.5.3 Preparation of Bodies	62
3.5.4 Preparation of Semi-porcelain Pellets	62
3.6 Preparation of Semi-porcelain Pellets Using Different Compositions	63
3.7 Preparation of Tile Using Raw Materials Without Purification	66
3.7.1 Preparation of Slip	66
3.7.2 Preparation of Tile-body	67
3.7.3 Preparation of Tile-engobe	68
3.7.4 Preparation of Tile-glaze	70
3.7.5 Preparation of Tile	70
3.8 Purification of Local Raw Materials	71
3.8.1 Purification of China Clay (ST) and Other Raw Materials by Hydrochloric Acid	71

	Page
3.8.2 Purification of Raw Materials by Sulphuric Acid	71
3.9 Analysis of Purified Raw Materials	72
3.10 Preparation of Semi-porcelain Bodies Using Purified Raw Materials	72
3.11 Preparation of Tile Using Purified Raw Materials	74
Chapter IV	
RESULTS AND DISCUSSION	76
Chapter V	
CONCLUSION	145
SUGGESTION FOR FUTURE WORK	147
HYPOTHETICAL PROCESS DESIGN	149
APPENDIX	153
CREDIT SEMINAR COMPLETED	169
REFERENCES	170