UNIVERSITI TEKNOLOGI MARA

A STUDY OF LOCAL TERRACOTTA CLAY AS GLAZE COLOURANTS

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Thesis submitted in fulfillment
of the requirements for the degree of
Master of Art
(Art and Design)

College of Creative Art

June 2023

ABSTRACT

Terracotta clay is a natural resource that has potential as a raw material in the ceramic field. Terracotta clay contains high koalinite after going through the analysis process. The purpose of this study was to investigate the effects of colour glaze using terracotta clay powder as an alternative substance for ceramic colourants in glaze formulation. Terracotta is a significant material used in adding transparent glaze to react with material to seed colour in the form of hematite during the firing process. Malaysia is distinctive as one of the prominent producers of terracotta clay. Clay have the potential to be developed with economical raw materials that provide further possibilities in terms of colour and texture. Terracotta clay is different from commercial pigments because of its raw mineral content. From kaolinite, iron, sand, quartz, and flint, it takes a long time to replenish this source again. The current study's goal is to identify local terracotta clay that can be used in the ceramic industry with low-cost process to produce coloured glaze. Next, to formulate the terracotta clay powder as a colour addition in the glaze formulation and to determine the firing temperature of the glaze with the addition of terracotta clay powder. This study employs experimental methods such as terracotta clay powder percentages as colourants in the glaze formula, as well as an X-ray fluorescence (XRF) test to investigate the chemical composition of terracotta clay, followed by a scanning electron microscope analysis (SEM) test to determine the iron oxide phases. Furthermore, terracotta clay powder was proportionately added to glaze formulations in order to determine the potential for colour to be added to glaze at temperatures ranging from 1140 ℃ to 1200 ℃. All samples are fired at gloss temperatures and involve three different types of ceramic bodies like porcelain, and stoneware clay. The subsequent colour on the ceramic body was identified through visual observation. In summary, amorphous colour derives from terracotta clay caused by the iron content and provides a potential alternative material for colourants in transparent glaze formulation. The content in terracotta clay powder is bound with potash feldspar, silica, zinc oxide, and calcium carbonate. From XRF test, 81% koalinite content was determined in terracotta clay powder, and the results also show the apparent colour of the surface on the ceramic glaze samples with different effects.

ACKNOWLEDGEMENT

Firstly, I wish to thank God for giving me the opportunity to embark on my Master and for completing this long and challenging journey successfully. My gratitute and thanks go to my main supervisor Dr. Nor Nazida Awang, and co-supervisor, and Prof. Madya Ts. Dr. Rusmadiah Anwar. Thank you for the support, patience and ideas in assisting me with this project. I also would like to express my gratitude to the Director of *Pusat Kraftangan Malaysia Cawangan Perak*, Mr. Mohammad Rizan Mohamad Nordin, the utmost cooperation and providing the SME product sampling.

My appreciation goes to, among others, Dr Salwa Ayob and and staffs of the College of Creative Arts, Universiti Teknologi MARA Perak Branch, Seri Iskandar who provided the facilities, knowledge and assistance. Also special thanks to my friends for helping me with this project.

Lastly, my sincere appreciation and very special thanks go to my loved ones for their support and understanding. Thanks goes to who participated either directly or indirectly situation for their help in the production of this thesis. Alhamdullilah.

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