

**PRODUCTION OF ENAMEL FRITS FROM  
INDIGENOUS RAW MATERIALS**

**Ph D DISSERTATION**

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## ABSTRACT

The objective of the present research is the utilization of the indigenous raw materials such as feldspar, fluorspar and quartz, clay etc in the preparation of enamel frits and also the improvement of the quality of these raw materials.

Enamel frits are widely used for the production of enamel coated materials in the industrial field as well as in the household utilities, sanitary wares and signboards, etc. At present, most of the enamel frits for use in enamelwares are imported from foreign countries. The local production is only for making ground coats on M.S sheets but just in quantities sufficient for the production of household wares. It is therefore felt that the local production of enamel frits will be beneficial to the country.

If enamel frits of required specifications can be produced by using these indigenous raw materials, they will contribute to a large range of industrial productions and will also save appreciable foreign exchange and improve the quality of local raw materials and enamelwares. All local clay contained some minor ingredients such as magnesium oxide, calcium oxide, titanium dioxide and ferric oxide, etc. Among them, ferric oxide is the most troublesome in the production of enamel frits and slips.

The characteristics of locally available raw materials such as feldspar, fluorspar and quartz were studied by conventional chemical analysis methods and also local clay samples from Minhla, Mudon, Shwetaung and Yankintaung, were studied by EDXRF (Energy Dispersive X-Ray Fluorescence) method.

Ferric oxide was removed by leaching with sulphuric acid and hydrochloric acid. In this research, enamel frits used in enameling on M.S Sheet, Cast Iron and Aluminium were prepared by using these indigenous raw materials in different ratios and different smelting times.

The physico-chemical properties of enamel frits such as powder baking test, fusion flow test, acid resistance test, thermal shock test, adherence test, etc were studied and compared with those of literature values mentioned especially in the foreign catalogues ( Escol Standard ).

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