

CHEMICAL CHARACTERIZATION OF INKS FOR INKJET DECORATION OF CERAMIC TILES

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ABSTRACT

The inkjet decoration of ceramic tiles has become the most widespread decoration technology in this field [1].

It is also a technology in constant evolution, in order to obtain: better color performances, inks with improved stability and rheological properties, lower production costs, etc [2].

Inks formulation is one of the most critical point because polluting emissions during firing, rheological parameters, jettability and stability of inks depend on inks formulation itself.

This study focuses on the characterization of inks now in commerce, to understand their thermal behavior, chemical composition, polluting emissions during firing and rheological properties.

We performed TG-DTA analysis, FTIR spectrometry, X-Ray fluorescence, and we are testing GC-MS and HPLC methodologies, on both inks and dispersing agents.

First data from TG-DTA seem to underline different thermal behaviors between different dispersing agents. By cross-checking these data with FTIR results, we divided our samples in 5 groups, depending on dispersing agents class: paraffin oil, esters, paraffin oil added with esters, tripropylene glycol n-butyl ether (TpnB), water added with paraffin oil.

From X-ray fluorescence on liquid inks and by comparison with literature [3,4], we recognized the chemical composition of coloring phases of inks. Our study is now focusing on testing GC-MS and HPLC methodologies to characterize polluting emissions, collected by firing a selected quantity of samples in a tubular kiln that simulates industrial processes.

The following step will be the cross-check of data coming from TG-DTA, rheological characterization, that will be carried out by ISTECCNR in Faenza (Bologna), and chromatographies. The final phase of this project will focus on a possible re-formulation of inks, to reach even better properties and decrease potential polluting emissions during firing processes.

REFERENCES

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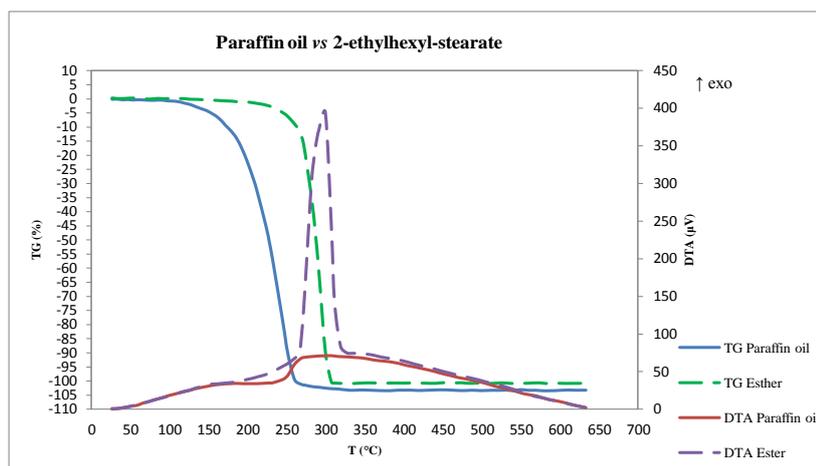


Fig.1 TG-DTA analysis of paraffin oil and a common dispersing ester