

STUDY OF COLOUR FORESIGHT IN DECORATION IN TRANSPARENT GLAZES

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The present study has sought to rationalise the use and foresight of colour in the execution of decoration in transparent glazes. The main objective was to develop a methodology to foresee a specific colour in the graphic phase of decoration design, instead of the frequently adopted empirical approach in the ceramic industry.

The study involved the analysis of formulations using pigments, a transparent glaze, and a screen printing vehicle. Different pigments, industrial inks, and commercial products were evaluated, in addition to graphic printing on different types of paper. It was verified that there was a great chromatic difference in some specific colours (green and black, for example) between the real colour of the ceramic product and the digital colour. This change occurs owing to the difference between the RGB colour systems and the CIE-L*a*b* system, which is most widely used in the colour measurement of objects. These results show that colour foresight in ceramic materials, from the conception to the final phase after the firing, is hard to achieve. In addition, the glazes were characterised by chromatic determination with a reflectance spectrophotometer, and an information history of the transparent glaze was obtained. Using this information and the Kubelka-Munk theory, a series of calculations were performed with a view to making product colours compatible with digital colours. The calculations made evidenced the fact that the Kubelka-Munk theory was difficult to apply in studied glazes. The creation of an information history of pigment chromatic coordinates in different concentrations is an important instrument when it comes to understanding pigment behaviour and interaction with the glazes. The study phases are outlined in figure 1. The results obtained by analysis of the chromatic coordinates of plain ceramic samples, in green and black (of the samples, and the printed and digitised images) may be observed in figure 2. Figure 3 shows an example of a comparative curve of the K/S values versus wavelength, measured and calculated by means of the Kubelka-Munk theory.

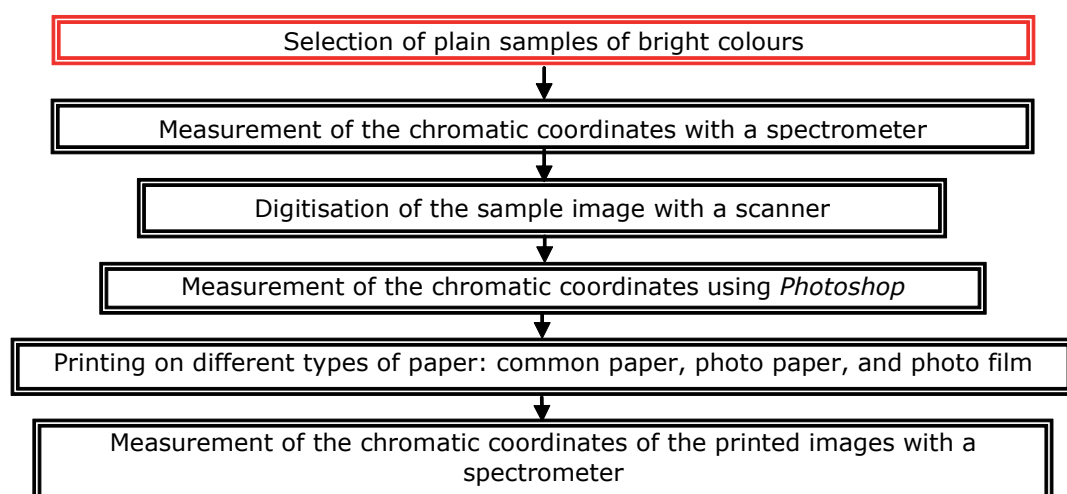


Figure 1. Flow chart of the study phases of the chromatic coordinates of plain commercial samples.

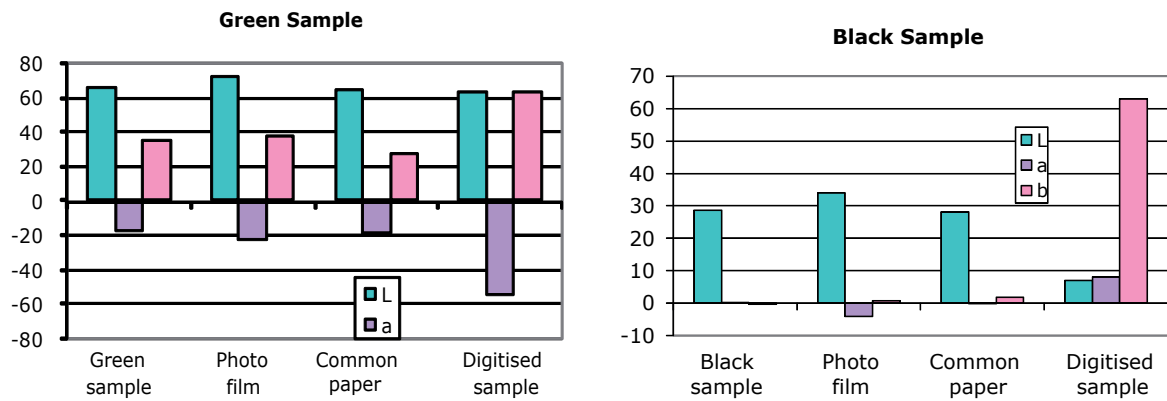


Figure 2. Chromatic coordinates of green ceramic samples (a) and black ceramic samples (b) of the digitised image on photo film, of the print on common paper, and of the digitised sample.

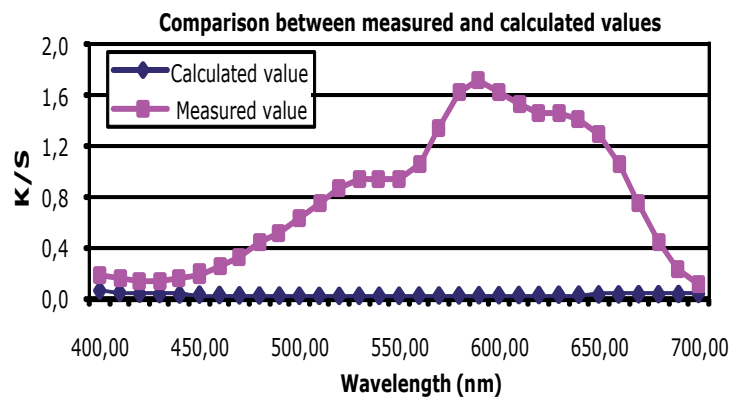


Figure 3. Comparison between the K/S values measured and calculated as a function of wavelength, for an ink with 5% blue pigment and 95% mustard-coloured pigment in a total pigment quantity of 3%.

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