Abstract

Translucent ceramic bodies provide a wider arena for artist's creativity with using light and shadow by shape and texture. In the present study, the main focus is on making and studying properties of low firing temperature fritted soft-paste porcelain which is improved its workability by adding appropriate percentage of cellulose fibers.

Practice-based research method has been used due to scientific-artistic nature of this thesis. The research process contains three parts: the experimental-laboratory method to achieve an appropriate translucent cellulose Porcelain, a descriptive method for philosophical and literary studies related to the theoretical foundations of artistic work and the experimental-artistic method of the process of designing the artwork by using 3D computer graphics and design soft wares and descriptions of construction steps. A low temperature fritted soft-paste porcelain was selected as a main body.

To improve the workability, the selected porcelain slip with 1.4 gr/cm^3density the raw materials contains clay and selected frit were mixed with 10, 20, 30 and 40% in volume paper pulp slip with 1.34 gr/cm^3density.

The results showed, the body containing 20% volume paper pulp has good plasticity, and lowest shrinkage with a little decreasing in strength. This body was selected as an optimal body, and further studies such as microstructural studies, light transmission, water absorption, apparent density, mass density, porosity and apparent porosity was carried out the soft porcelain (SP) and the body containing 20% volume paper pulp (CSP2). XRD results clearly showed that the fired soft-paste porcelain contained quartz, mullite, anorthite and albite in the fired state. Furthermore, adding cellulose to porcelain body improved the workability, green strength and slightly translucency of the body slightly improved in the wavelength range 400 to 500 nm.

After preparing the appropriate cellulose composite soft paste porcelain body through the experiments, the idea of the art work, entitled "Imagination Flying"based on the Hekmat-al-Eshraq philosophy of Suhrawardi and mystical literature, was carried out in the software, after final evaluation and approval, some parts of it was 3D printed and gypsum mold were prepared and worked by slab method also some parts was made by Hand. Addition of cellulose in to the soft paste porcelain body caused a significant increase in the green strength and making big parts without any cracks and facilitated making of very thin sheets (about 0.7 millimeters).

Making translucent porcelain with proper workability, short (5 hours) and low temperature (1120 ℃) firing is an important achievement of this research that creates a new horizons for the creation of semi-transparent ceramic artworks.

Key words: translucent porcelain; fritted porcelain; cellulose composite porcelain; light; ceramic.