



Mössbauer spectroscopic and chromaticity analysis on colorative mechanism of celadon glaze

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Abstract

The dependence of the color of a celadon glaze on the chemical composition and the electronic state of Fe was investigated by Mössbauer spectroscopic and chromaticity analysis. The amount of Fe₂O₃ was found to be the main factor influencing L^* and b^* values, whereas the amount of TiO₂ was found to affect all the parameters (L^* , a^* , b^*). The effect of MnO on the color was significant only by interaction terms. The amount of P₂O₅ was found to be the main factor of the b^* value. According to the Mössbauer analysis results, as the amount of divalent iron ions increases, the a^* and b^* values decreased; on the other hand, the L^* value increased. As the amount of titanium increased, Fe²⁺ was found to be destabilized relative to Fe³⁺ due to the structural instability of Fe–O–Ti network.

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