

Crystalline Glazes: Crossing Boundaries

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Crystalline glazes are unique in a way that they demonstrate distinct crystal growth in the matrix of the molten glaze. Various requirements for successful glazes with macro-crystals include high fluidity, coating thickness, special chemical composition and firing condition. Willemite (Zn_2SiO_4)-based crystals was well known to produce spectacular effects with various sizes and shapes appearing to float on a glaze background. However, for most potters, such fascination is frequently, if not always, coupled with frustration due to their complexity in nature. In order to tackle these difficulties, scientific fundamentals behind the crystal growth phenomena in the glazes should be established in addition to the already pressing constraints of art and design of the products. This study was focused on the paradigm of materials science (structure-processing-property) in order to exemplify the incorporation of aesthetics into the basic scientific principles of materials chemistry and characterization. Through interdisciplinary research with the artist from the Faculty of Decorative Arts at Silpakorn University, this study has fostered and manifested the concept of integration in crystalline glazes, eliminating the explicit boundary between art and science. By bridging expertise in both materials engineering and ceramic art design, the aesthetic work based on the art-science integration concept has been successfully demonstrated and exhibited at the National Research Expo in 2014. This perception of academic boundary crossing has proved to be pivotal, if not inevitable, for perfecting and progression towards both improvement and innovation of pottery products.