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## Synthesis of ultramarine pigment from the mudstone of kutingkeng formation and the improvement of its refractory properties

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Ultramarine ( $\text{Na}_{8-x}[\text{SiAlO}_4]_6[\text{S}_2\text{S}_3\text{SO}_4\text{Cl}]_{2-x}$ ) is an inorganic nontoxic blue pigment, consists of an aluminosilicate framework, constructed from sodalite cages ( $\beta$  type). In this study, the mudstone from Kutingkeng Formation exposed in Southern Taiwan was used as the raw material to synthesize ultramarine pigment via a traditional solid state reaction route. The mudstone was first hydraulically classified to collect the  $<2\text{ }\mu\text{m}$  part. The  $<2\text{ }\mu\text{m}$  part was mixed with sodium carbonate, sulfur and active carbon, formed into agglomerates and calcined at  $800^\circ\text{C}$  for 8 hr. The color characteristics of the products were measured by the CIE  $L^*\text{a}^*\text{b}^*$ -system. The best hue, lightness and chroma obtained are  $289^\circ$ , 30.6 and 66.8, respectively. Due to the poor high temperature stability of the ultramarine, further studies of coating a silica film on the ultramarine particles were performed. The results showed that the coated ultramarine can tolerate temperatures as high as  $1000^\circ\text{C}$ . This may create a new application of ultramarine as a glaze pigment.

### Biography

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