
Experimental Heating and Non-Destructive Analyses of Heat-Altered Serpentinite Vases from Bronze Age Crete

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Résumé

This study presents evidence of heated stone vases, focusing on a group of twenty-five red-coloured vases from the late protopalatial site of *Quartier Mu* (Malia, Crete, 1800-1700 BCE). While their hue has sometimes been attributed to accidental exposure during a destructive fire, we assess here the intentionality of this transformation using a fully portable and non-destructive analytical approach combining X-ray fluorescence and magnetic susceptibility analyses with controlled heating experiments on local serpentinite. Macroscopic observations and pXRF analyses confirm that the red vases are made from the same serpentinite as used in the rest of the assemblage and show no trace of detectable external pigments. The pMS results indicate a significant loss of magnetism, which our experiments attribute to the transformation of magnetite into weakly magnetic oxides at temperatures above 700°C under oxidising conditions; this is also the threshold at which the red colouration appears. These results indicate a necessary high heating temperature condition which does not appear to coincide with the contextual destruction fire evidence. These results highlight a hitherto underdocumented technological innovation in the production of Minoan stone vases and suggest that intentional heat treatment may have been part of a wider craft system in the *Quartier Mu*. This study also demonstrates the value of combining experimental petrology and non-destructive in situ analysis to study ancient heating techniques while ensuring the complete integrity of the artefact.

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