
Micromechanical properties of altered surfaces of archaeological glass fragments

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Abstract

Surfaces of glasses exposed to weathering in aqueous environments undergo after long periods of time considerable alteration due to ion exchange, hydration and hydrolysis resulting in opaque crusts or iridescent layers. The morphology of the alteration layer of archaeological glass fragments depends on environment. For land-based environments banded layers (parallel to the surface) were observed, while marine environments showed besides banded textures, flaky and spongy morphologies of alteration. Going in hand with changes in the morphology and the chemical composition of the alterations, mechanical properties of the glass fragments and their alterations are observed to vary considerably which are tested by micro bending and Vickers indentation. Studies are intended to shed light on the mechanical robustness of archaeological glass fragments and the cohesion between alteration textures and unaltered glass.

Keywords: archaeological glass fragments, surface alterations, micromechanical properties

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