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Correlation between Ionoluminescence signal and the manufacturing conditions of the clay bodies of ancient tiles

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The first uses of tiles appeared in the region of Mesopotamia, Egypt and Persia, being the beginning of an enduring tradition. From there, the tile manufacturing technology and utilization spread worldwide, usually through commercial circuits, and consequently the tile evolved and adapted to each culture and local styles.

Tiles are composed of a ceramic body covered by a vitreous glaze layer, which is usually coloured. The ceramic body acts as support of the glaze and its quality is essential for the good conservation and preservation of tiles along the centuries. Some of the factors which will affect the ceramic body quality are the kiln temperature during the manufacturing process and also the raw materials used. In this sense, underfired bodies will tend to be soft, and brittle when they are overfired. The initial clays will also affect the final composition of the ceramic body, with influence for example in its hardness or final colour.

In this work we propose the combination of non destructive IBA techniques to assess the manufacturing conditions of ancient tiles, specially the ceramic body. The conditions to be determined are:

- the identification of the raw materials through the study of the elemental composition by means of PIXE and PIGE techniques;
- the firing temperature through the study of the compounds or particular mineral phases present in the ceramic body by means of IL measurements.

In this work a set of tiles with quite different chronological production (from the XVII to the XX centuries) were analysed and the obtained results will be presented and discussed.

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