

**FIRING TEMPERATURE OF POTTERY AND DATING OF WALL-PAINTINGS;  
TWO PROMISING POTENTIAL LUMINESCENCE APPLICATIONS OF  
ARCHAEOLOGICAL INTEREST**  
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Luminescence in both thermoluminescence (TL) as well as optically stimulated luminescence (OSL) form has been increasingly used for dosimetric purposes that presently constitute an important part of solid-state dosimetry in various fields, such as medical, environmental, personal, space and retrospective dosimetry. The case of retrospective dosimetry, consists of two major categories, namely the archaeological luminescence dating and accidental dosimetry. However, besides dosimetry and dating, several alternative, as well as promising applications have either been reported or just attempted. The aim of the present work is to present two such applications, namely the determination of the firing temperature of ancient ceramic shreds in the laboratory, as well as some preliminary data towards dating of wall paintings. In the former case, luminescence techniques take full advantage of sensitivity changes of quartz grains ubiquitously present in the clay matrix, as these grains are heated during the manufacture procedures. Therefore, this study aims in identifying whether quartz grains in the ceramic fabric can carry the memory of their thermal history up to present

day, in the case of antiquity ceramic artifacts collected from the area of ancient Mesopotamia, Turkey. The ages of these pottery samples are expected to be approximately 6-8 ka. Various segments of the sample were annealed to temperatures ranging from 300 to 900 °C. Subsequently, different luminescence signals such as TL and Linearly Modulated (LM-OSL) signals were measured for each annealing temperature, while several luminescent features such as glow curve shapes, thermal and predose sensitization trends versus re-firing temperature are investigated towards this direction.

In the case of the second objective, mortar samples were collected from the wall paintings of the Archbishopric Church in Drustar, Bulgaria, which is a basilica - type building, in whose design are present many elements suggesting its connection to the church traditions of the Balkans in the VIth century. Several techniques, such as TL, OSL as well as Infrared stimulated luminescence (IRSL) were applied to the Ca-based mortar collected, in order to get preliminary results on the wall paintings creation chronology.