

## Testing the application of post IR IRSL dating to Iron- and Viking-age ceramics and heated stones from Denmark - DTU Orbit (08/11/2017)

### Testing the application of post IR IRSL dating to Iron- and Viking-age ceramics and heated stones from Denmark

In this study we test, for the first time, the potential of an elevated temperature post-IR IR (pIRIR<sub>290</sub>) SAR protocol for the dating of young heated artefacts. Seven heated stones and seven potshards were collected from three different archaeological sites in Denmark: one site from the early Pre-Roman Iron Age 200 BC to AD 100, and two from the Viking period between AD 800 and 1200. We first derive quartz OSL ages for these samples, to support the archaeological age control. The luminescence characteristics of the pIRIR<sub>290</sub> signal are then investigated; in particular the dose recovery ratios are shown to be close to unity. The performance of the feldspar pIRIR<sub>290</sub> protocol is then examined by comparing the pIRIR<sub>290</sub> ages with those based on the quartz OSL signal; the average ratio of pIRIR<sub>290</sub> to OSL ages is  $1.14 \pm 0.05$  ( $n = 14$ ) and there is some suggestion that the possible overestimation of the feldspar ages compared to quartz is only of significance for the heated stone samples. Nevertheless, there is no indication of incomplete heating of the stones; the ratios of  $D_e$  derived from the IR<sub>50</sub> and pIRIR<sub>290</sub> signals are independent of sample type, and consistent with complete resetting by heating. Comparison with the archaeological age control is not able to identify whether quartz or feldspar provides the most reliable dating signal. © 2015 Elsevier B.V. All rights reserved.

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