Laboratory fading rates of various luminescence signals from feldspar-rich sediment extracts - DTU Orbit (08/08/2019)

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Feldspar as a retrospective dosimeter is receiving more and more attention because of its useful luminescence properties; in particular the dose response curve extends to significantly higher doses than quartz. However, feldspars have one major disadvantage; both the thermoluminescence (TL) and optically stimulated luminescence (OSL) signals exhibit anomalous (athermal) fading. Much of the OSL work carried out on feldspars in recent years has focussed on determining fading rates and correcting for them. Almost all work has been carried out using IR stimulation at 50 degrees C detected in the blue region of the spectrum. In contrast, we have determined fading rates for various sedimentary feldspar samples using different stimulation and detection windows. If the initial part of the OSL signal is used the lowest fading rate is observed with post-IR blue stimulation (UV detection), but if a later part of the signal is used the lowest fading rate is obtained for IR stimulation (blue detection). Daylight bleaching experiments show that, unlike quartz, the initial and final parts of the feldspar OSL signal bleach at approximately the same rate. Stimulation at elevated temperatures significantly reduces the apparent fading rate. This signal appears to bleach more rapidly in daylight than the signal observed when stimulation is at 50 degrees C (for IR stimulation and blue detection). We conclude that there are OSL signals from sedimentary feldspars which fade at a significantly lower rate than the signal used conventionally, and that further testing of these signals is warranted to see if they are dosimetrically useful. (C) 2008 Elsevier Ltd. All rights reserved.

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