

# SOME RESULTS ABOUT CORRELATION BETWEEN OSL AND TL EMISSION OF THE QUARTZ

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**Introduction:** Nowadays Thermoluminescence (TL) and Optically Stimulated Luminescence (OSL) emission of quartz is widely used for sediments and potteries dating. OSL is used more frequently because the OSL zeroing occurs with few minutes of sunlight exposure, while the TL signal decays to a residual value after several days of exposure. In order to better understand the kinetics of emission of OSL and TL, as well, the centers responsible for these emissions, many authors investigated and found that the OSL signal of the quartz is correlated with the 325 °C TL peak [1]. However, in the present work, some brazilian quartz samples from different origins were investigated, to try to observe this correlation and dissimilar results were found

**Experimental:** Three samples were used, the colorless hyaline quartz, green quartz and quartz from sediment. The hyaline and green quartz were cutted into slides and sediment quartz grains were sieved, separating grains between 75 and 150 µm. Samples aliquots were irradiated (10 Gy) using a beta source (<sup>90</sup>Sr/<sup>90</sup>Y) coupled to the Risø reader. TL measurements were carried out with Risø TL / OSL reader automated, model TL/LOE-DA-20, with preheating at 180 °C in order to avoid the 110 °C TL peak. OSL-LM measurements were carried out using blue light (470 nm).

Fig. 1 shows the TL glow curve without previous OSL stimulation (black line) and TL with previous OSL stimulation (blue line), red line is obtained subtracting the first TL glow curve from the second one, showing, therefore, the contribution of the OSL on TL glow curve.

**Results and Discussion:** Experimental results show that the OSL signal is not, always, directly correlated to the 325 °C TL peak. For the hyaline quartz a weak contribution is observed only about 200 °C and no contribution on 325 °C could be observed. On the other hand, the green quartz shows a contribution on 325 °C like unique influence, only in this case we can say that the OSL signal is correlated to the 325 °C TL peak. For the sediment sample we can ob-

serve an intense effect at about 225 °C and another one less intense, but wide peak about 350 °C.

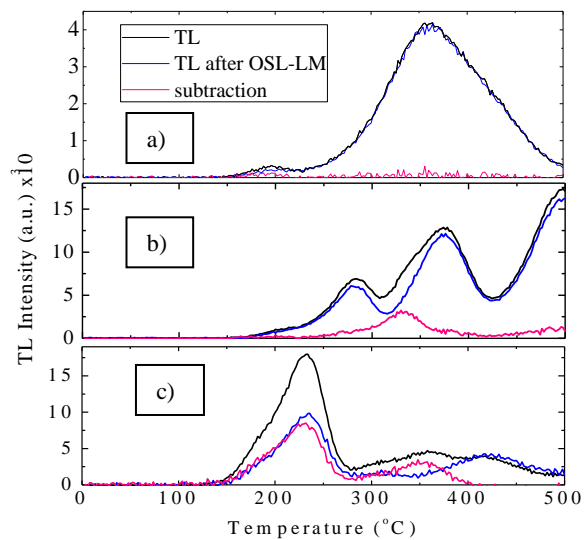


Fig. 1- TL glow curves for quartz samples without previous OSL stimulation (black); with previous OSL stimulation (blue) and the subtraction of the two curves (red). a) hyaline quartz, b) green quartz and c) quartz extracted from sediments.

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## References:

[1] Kitis G., Kiyak N., Plymeris G.S., Tsirliganis N.C., **2010**, The correlation of fast OSL component with the TL peak at 325 °C in quartz of various origins, *Journal of Luminescence* *130*, 298-303.