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TL and OSL on Diopside crystal

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The diopside with chemical composition $CaMgSi_2O_6$ is part of an important solid solution series of the pyroxene group. The mineral is commonly found in meteorites and it is an important rock forming mineral of medium and high grade metamorphic rocks which are rich in calcium. In the bibliography it is possible to found several studies on electron spin resonance (ESR), reflectance, etc. but not on thermoluminescence (TL) or optically stimulated luminescence (OSL). In the present work we studied diopside's TL and OSL behaviour on natural and natural irradiated samples. The sample used in our study is a white coloured diopside provided by Mineração São Judas located in Sao Paulo, Brazil. The X – Ray Fluorescence technique has shown high concentrations of SiO_2 (55.81 % mol), CaO (23.47 % mol), MgO (18.03 % mol), Al_2O_3 (1.56 % mol), Fe_2O_3 (0.53 % mol), K_2O (0.44 % mol), TiO_2 (0.065 % mol), P_20_5 (0.026 % mol), and MnO (0.013 % mol). TL measurements on natural samples show four TL peaks at 160, 260, 360, and 450°C. After beta-irradiation an increment mainly in the low temperature peaks is observed. As for OSL measurements, low OSL signal was observed on natural samples using blue light stimulation and UV detection. The intensity of the signal was observed to increase with the irradiation dose.