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THERMOLUMINESCENCE TRAPPING PARAMETERS OF IRRADIATED K-FELDSPAR

Tuesday, 12 July 2022 15:40 (20 minutes)

Isothermal decay of TL glow curve of the irradiated K-feldspars has been investigated at an ambient temperature. A suggested procedure enables the isolation of peaks at the low-temperature region of the TL glow curve. An analysis of the values of the symmetry factor suggests that bimolecular mechanisms are responsible for the kinetics of decay processes, as the values of parameter μ [1] vary around 0.52. The values of the calculated activation energy do not show systematic correlation with the temperature at the investigated temperature region of TL glow curve. The frequency factor values of the isolated peaks change within the physically meaningful figures (within the order of 109 to 1013s-1) and in good agreement with the literature [1]. ESR and TL investigations revealed that [2], when feldspars such as microcline and albite are irradiated at liquid nitrogen temperature, both Al-Oh+ and a hydrogen radicals are formed. As soon as the temperature of the samples rises to room temperature, the hydrogen radical eliminates completely and Al-Oh + -Al centers appear. Thermal annealing at 1000 ° C leads to the formation of two new hydrogen radicals which are relatively stable even at room temperature. It has been suggested that they could act as killers for Al-Oh + -Al centers in both feldspars which might be the case in the current situation.

References
[1] R. Chen, V. Pagonis, and J. L. Lawless, "Evaluated thermoluminescence trapping parameters-What do they really mean?," Radiat. Meas., vol. 91, pp. 21–27, 2016, doi: 10.1016/j.radmeas.2016.04.006.
[2] T. Hashimoto, E. Nishiyama, and Y. Yanagawa, "Radiation-induced luminescence and hydrogen radical formation associated with thermal annealing treatments on feldspars," J. Radioanal. Nucl. Chem., vol. 255, no. 1, pp. 81–85, 2003, doi: 10.1023/A:1022275630127.

The speaker is a student or young scientist

No

Section

1. Applications of nuclear methods in science and technology

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