

## Examination of dose dependence for quartz-TL using automated reader with four optical paths

\*Yorinao Shitaoka<sup>1</sup>, Junji Yamamoto<sup>2</sup>, Masaya Miyoshi<sup>3</sup>, Naoya Obata<sup>4</sup>, Tsuneto Nagatomo<sup>5</sup>

1.Department of Environment System, Faculty of Geo-environmental Science, Rissho University,

2.Hokkaido University, 3.University of Fukui, 4.Hiruzen Institute for Geology and Chronology Co., Ltd., 5.Nara University of Education

From minerals such as quartz, thermoluminescence (TL) is emitted from electrons in the electron traps as they recombine with holes in the recombination center. When a mineral crystal has recombination centers of several types, TL of several wavelengths with different cross-sections might be emitted. Consequently, the dose-dependence of a particular TL might differ from other TL of a different wavelength. When applying TL to dating, linear dose dependence is preferred along with strong TL sensitivity (Nagatomo *et al.*, 1999).

We designed and constructed a TL/OSL (NUE-05-OSLTL) reader that has four light paths with four condensing lenses and four PMTs for choosing the suitable luminescence wave range for dating (Shitaoka, 2015). The wave ranges of the four lens and optical filter assemblages are usually 300–390 nm, 390–590 nm, 570–700 nm, and 350–700 nm.

This study used an NUE-05-OSLTL reader to measure mafic lavas in the Oninomi monogenetic volcano in northern Kyushu, Japan, which include small amounts of quartz xenocrysts (Ohta *et al.*, 1992).

The TL-dose dependences from four wave ranges will be presented during the poster session.

Keywords: Thermoluminescence, dose dependence, linearity, quartz, Oninomi lava