Ar-Ar dating for volcanic rocks from Bowers Ridge, Bering Sea at site U1342A and U1342D

Keiko Sato[1], Hiroshi Kawabata[1], Hironobu Hyodo[2], Hidenori Kumagai[1], David W. Scholl[3], Kozo Takahashi[4], Katsuhiko Suzuki[1]

[1]IFREE, JAMSTEC, JAPAN, [2]Research Institute of Natural Sciences, Okayama University of Science, JAPAN, [3]U.S. Geological Survey, Menlo Park, University of Alaska„ USA, [4]Hokusei Gakuen University, JAPAN

E-mail: keisato@jamstec.go.jp

Basement rocks were drilled down to ca. 42 m into the volcanic sequence directly underneath the sedimentary section at Site U1342 on Bowers Ridge during the IODP Expedition 323 to the Bering Sea. This provided us an opportunity to describe the details of the sequence and to decipher the virtually unknown origin and evolution of the Bowers arc massif. There are two contrasting hypotheses for the origin of the arc, which include formation in the Pacific Basin well to the south of its present location during the Cretaceous and in-situ formation within the Bering Sea in Eocene.

The volcanic sequence recovered from Site U1342D was divided into six major lithological units: Unit 1, vesiculated andesitic lava flow; Unit 2, interbedded volcanic sandstones and polymict volcanic conglomerates; Unit 3: monomict volcanic conglomerates; Unit 4, interbedded volcanic sandstones and polymict volcanic conglomerates; Unit 5, monomict volcanic conglomerates; and Unit 6, polymict volcanic conglomerates. Units 3 and 4 represent hydroclastic volcaniclastics, while units 2, 4, and 6 are epiclastic volcaniclastics (Kawabata et al., 2011). We used the single grain Ar-Ar dating method by step-wise laser fusion for Unit 1 basaltic andesite rocks.

We collected basement volcanic rock samples from U1342A 9x section and U1342D 7x 19x sections. The vesiculated porphyritic basaltic andesite at U1342A 9x and U1342D 7x- (Unit 1) and the porphyritic basaltic andesite at U1342D 8x (Unit 1) are fresh samples and are good for single grain method of step-wise laser fusion Ar-Ar dating. We distinguish for the first time two stage (age groups) of activity (34-32Ma and 28-26Ma) from our Ar-Ar data, coupled with those from Wanke et al., (2012).