

**CORONA TEXTURE OF QUARTZ AND K-FELDSPARS AT IMPACT CRATER STRUCTURE OF TAKAMATSU-KAGAWA DISTRICT IN JAPAN.** Y.Miura, Dept. Earth Sci., Fac. Sci., Yamaguchi University, Yoshida 1677-1, Yamaguchi, Yamaguchi, 753-8512, Japan. [yasmiura@yamaguchi-u.ac.jp](mailto:yasmiura@yamaguchi-u.ac.jp)

**Introduction:** As a characteristic impact crater in Japanese volcanic islands, buried crater structure estimated geophysical data [1,4] at Takamatsu-Kagawa buried structure originally with about 8km size located in Busshozan-Cho, Takamatsu City, Kagawa Prefecture (in center site) to Kagawa-Gun, Kagawa Prefecture (in Southern part) are reported by (1) shocked data and (2) broken by tectonic movement [5-7]. Among shocked data the detail coronas (necklaces) textures of basement rock of granite at the drilled samples are studied in this paper as main purpose. Takamatsu-Kagawa buried structure originally with about 8km size in this paper is the same as Takamatsu crater with 4km as geophysical data [1-4] as shown in Fig. 1. This is only to make a point to original size and broken after small volcanic intrusion along cracked vein inside the original crater structure during formation of Japanese islands as first case. The center of the crater structure is the same as Latitude 34.3° and Longitude 134.05°.

**Locations of corona texture:** The breccias sample of corona texture are only found at drilled site of northern part of present 4km crater structure, where is no intrusion of small intrusion along the cracks. The breccias samples with grey dark dotted breccias are found from 450m to 1125 in depth. The TK610 sample used in this study is 610m in depth (cf. Fig.1).

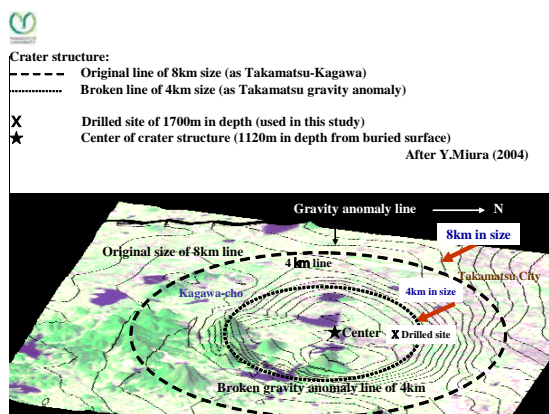


Fig.1. Sampling site of drilled TK610 (as shown by X) in gravity anomaly line of 4km (as inner ring) after broken and buried activities from original 8km line found by shocked data (s outer ring) [1,2,3,4,5].

**Bulk chemical composition of drilled TK610 sample:** Bulk XRF data of the drilled sample TK610 is granitic composition as 74%SiO<sub>2</sub>, 14%Al<sub>2</sub>O<sub>3</sub>, 3%K<sub>2</sub>O, 3%Na<sub>2</sub>O, 1%CaO, 1%Fe<sub>2</sub>O<sub>3</sub>, and 0.2%MgO. This suggests that breccias sample TK610 is the same as other breccias samples from 450m to 1125m in depth which are no effect of small volcanic intrusion along the small vein on the bulk XRF composition [5].

**Corona texture:** There are various flow-shapes of elongated corona (necklaces) texture as follows:

1) Major corona texture of K-feldspar K (clasts as rim) and quartz Q (matrix as core) as various elongated sizes with 0.1mm to 0.4mm size, which is formed by less evaporated components of silica coated more evaporated component of K-feldspar after impact reaction (as shown in Fig.2).

2) Minor corona-in-corona texture of K-feldspar K (clasts in 0.4mm size) contains quartz as round shape (40 μm size) and small linear texture of K-feldspar K and quartz Q as connected melted margin in the core from 0.1mm to 10 μm size (as shown in Fig.3).

3) Only larger corona texture contains darker grain X (by BEI photo of the analytical scanning electron microscope ASEM, in Figs 2 and 3) which is considered to be C-K-Si-Al-O in composition from K-feldspar of granitic rock after impact.

4) These grains in corona texture is considered to be impact origin, because there are no large volcanic elements (S, Mg etc.).

**New evidence of impact origin of corona texture:** The present corona texture shows impact origin as following data:

1) The corona texture contains carbon analyzed with the ASEM (for light elements) in K-feldspar K and silica Q phases (as shown in Figs 2 and 3). But carbon content in K-feldspar grain KF from target rock of granite has little carbon content as normal composition (as shown in bright fragment KF in Fig.2). Carbon found only in corona texture is considered to be from impact reaction in the carbon-rich Earth atmosphere.

2) The bulk sample contains Fe=3.3 (%), Ni=3 (ppm), and Co=12 (ppm) by the ICP-AES analyses.

**Summary:** The present results are summarized as follows:

1) Corona textures of quartz and K-feldspar derived from granitic basement rock are found at drilled breccias (TK610m) at the Takamatsu-Kagawa district in Japan.

- 2) Complicated “corona-in-corona texture” is also found by clasts (rim) of K-feldspar, and matrix (core) of quartz and phase X (originally from K-feldspar).
- 3) The corona texture contains carbon analyzed with the ASEM (for light elements) in K-feldspar and silica phases.
- 4) The bulk sample contains Fe=3.26 (%), Ni=3 (ppm), and Co=12 (ppm) by the ICP-AES analyses.
- 5) These data in this paper indicates that breccias TK610 sample has been formed originally from impact event at granitic basement rock.

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**References:** [1] Kono Y. et al. (1994): *Report of Kaken B (Japan)*, 36pp. [2] Miura Y. Ed. (1999): *PIECE'99 Symposium paper abstract volume* (Yamaguchi University, Yamaguchi, Japan), 94pp. [3] Miura Y. Ed. (2000): *IFIE'00 Forum paper abstract volume* (Yamaguchi University, Yamaguchi, Japan), 30pp. [4] Miura Y. (2003): *IEJSAP'03 symposium abstract paper volume* (Yamaguchi University, Yamaguchi), 10-20. [5] Miura Y. (2005): *LPS XXXIII*, abstract #2394. [6] Miura Y. (2002): *Proc. NIPR Antarctic Meteorites* (NIPR, Tokyo), 25, 35-38. [7] Miura Y. (2002): *LPS XXXIII*, abstract# 1231.

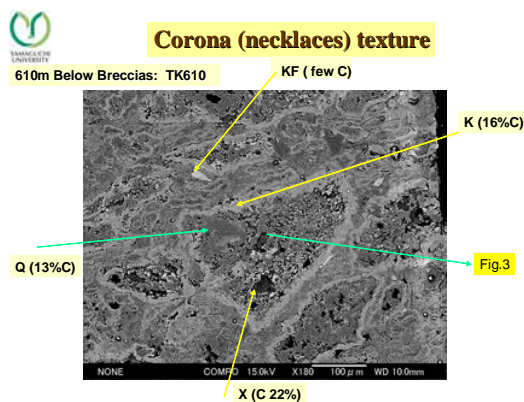


Fig.2 Electron microscopic photo (BEI) of sample TK610 to show various corona texture. Q is silica, K and KF means K-feldspars. X shows phase of C-Si-Al-K. These anomalous compositions of K,Q and X are formed by impact reaction. Corona texture in the corona texture is shown in Fig.3. Bar is 100  $\mu$  m.

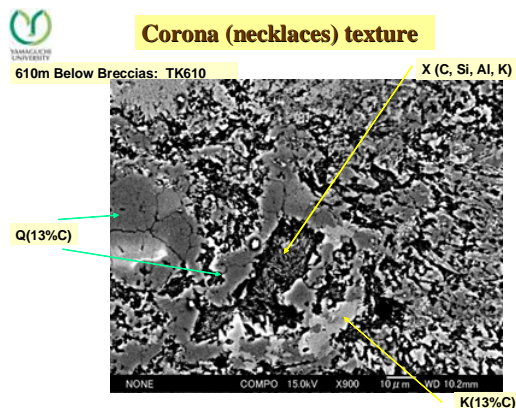


Fig.3. Electron microscopic photo (BEI) of sample TK610 to show inner corona texture shown in Fig. 2. Q is silica, K means K-feldspars. X shows phase of C-Si-Al-K. These anomalous compositions of K,Q and X are formed by impact reaction. Significant carbon contents indicate that this was formed in impact reaction on the Earth atmosphere. Scale bar is 10  $\mu$  m.