

## Formation of quenched impact corona texture of buried and broken impact structure at Takamatsu-Kagawa district in Japan

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Corona-necklaces texture is formed from quenching of original rocks. Quenching of volcanic rocks is formed from compositions and minerals of volcanic magma including mafic minerals. Quenching of acidic basement rocks of granites by meteoritic impact melting forms corona texture of acidic minerals of quartz and K-feldspar, which does not include composition of mafic minerals of volcanic magma from higher mountain topography.

For this example in volcanic islands of Japan, result of corona texture is shown at drilled samples 610m in depth of Takamatsu, Kagawa district as buried impact crater.

As a characteristic impact crater in Japanese volcanic islands, a buried and broken crater structure estimated from satellite, topographic, geophysical and drilled data at Takamatsu-Kagawa buried broken-structure originally with about 8km size located in Takamatsu City, Kagawa Prefecture are reported by shocked data and broken by later tectonic movement. Among shocked data, the detailed coronas-necklaces textures of basement rock of granite from the drilled sample TK610 are reported here.

The breccias sample of corona texture is only found at drilled site of northern part of present 4km crater structure, where no volcanic intrusion of along the cracks is observed to form a small mountain on the surface. The breccias with grey dark dotted texture are found from 450m to 1125m in depth. The TK610 sample used in this study shows shocked metamorphosed texture and Fe-Ni bearing grains from 610m in depth.

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.

There are two types of flow-shapes and elongated corona-necklaces texture as follows:

1) Major corona texture of K-feldspar K (clasts as rim) and quartz Q (matrix as core) shows various elongated sizes with 0.1mm to 0.3mm size, which is formed by less evaporated components of silica coated more evaporated component of K-feldspar after impact reaction .

2) Minor coronas-in-coronas texture of K-feldspar K (clasts in 0.3mm size) contains quartz as round shape (0.05mm size) and small linear texture of K-feldspar K and quartz Q as connected melted margin in the core from 0.1mm to 0.01mm size.

Darker grain X phase by the BEI photo of the analytical scanning electron microscope ASEM in the core is considered to be C-K-Si-Al-O in composition from K-feldspar of granitic rock after impact.

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

The present results are summarized as follows:

1) Two types of corona textures of quartz and K-feldspar derived from granitic basement rock are found at drilled breccias (TK610) at the Takamatsu-Kagawa district in Japan.

2) Complicated corona texture shows coronas-in-coronas texture of K-feldspar and quartz.

3) The corona texture contains carbon analyzed with the ASEM (for light elements) in K-feldspar and silica phases, probably from impact reaction.

4) Darker grain phase X in the core is considered to be composition of K-feldspar with much carbon of granitic rock after impact.

5) The corona texture contains carbon in K-feldspar and silica phases which are obtained only in corona texture from impact reaction of the carbon-rich atmosphere.

6) The present data in this study indicate that breccias TK610 sample has been formed originally from meteoritic impact event on granitic basement rock.