

Mystery of Mt. Shinobuyama

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1. Introduction

Mt.Shinobuyama is the vital place for citizens in Fukushima city. The mountain has the rare landform that is isolated in the center of the Fukushima basin, and the several opinion could be made on formation process of the mountain.

It is important for us, students of Fukushima High School, to research and reveal the formation of Mt.Shinobuyama because the mountain is significantly geographical and cultural.

2. Hypotheses

The following theories are put forward which are considered as Mt.Shinobuyama' s geological information and formation process from acknowledgement.

- a. Mt.Shinobuyama' s texture is different in east and west. The western part consists of pyroclastic flow deposit, while the eastern part consists of tertiary sedimentary.
- b. Tertiary marine stratum are uplifted and Mt.Shinobuyama became hard. The stratum consist of tuffs so that the western part became harder.
- c. The surface of Mt. Shinobuyama is covered with rhyolites.

In this way, several theories are put forward. In this research, we consider the formation process and conduct what theories are valid.

3. Method

3-1 the outcrops observation

We climbed the mountain, observed 12 outcrops, and collected the stones near the outcrops. The points of the outcrops are showed in the figure.

3-2the observation of the thin sections with a polarization

We could make two thin sections, and these rocks are at point 3 and 4.

3-3 the observation with a Scanning Electron Microscope (SEM)

Using a SEM, we observed the surfaces of the stones, at point 3 and 4, and measured the size of the particles making up the stones.

3-4the mineral identification with X-ray diffraction (XRD)

We inspected the stones, at 1, 2, 9, 11, with XRD for the purpose of identifying of the mineral making up the stones.

4. Result

4-1 Result of outcrop observation

The rocks of No.1,2,3,7 are very hard. When we hit them by hammer, sparks are produced. The color of surface is gray. Moreover, they had large cracks. We think they were caused by weathering.

The rocks of No.4,5,6,10,11,12 are so fragile that we can break them by our hands. Their color is mostly orange, depending on places, curved stripe whose color is orange is observed. Particles making up these

rocks are muddy and very fine.

4-2 Result of thin sections observation

We observed No.3 rocks. There are colorless minerals which has strong polarization. These minerals are not observed on surface, but observed only in cross section. What is more, each mineral has sharpened corners, so we think these quartz are teared.

The rock of No.4 is composed of clastic particles.

The size is about $5\mu\text{m}$. The color is mostly orange and small stripes are observed. The width is about 1~2mm.

4-3 Result of SEM

Both the stones of point 3 and 4 are consisted of small sharp particles.

We randomly chose these particles and measured their size. As a result we found that there was no difference in the size of rocks of two outcrop.

4-4 Result of XRD

Rocks of point 1 and 2 include small amount of feldspar, but it was revealed that principal component of rocks of all points were quartz.

5. Consideration

We found three new facts through our research.

A) The rocks have different color firmness depend on east/west of Mt.Shinobuyama.

B) Rocks of Mt.Shinobuyama is tuff, and most of particles that configure are quartz.

C) Potash feldspars are found in the west side of Mt.Shinobuyama.

We guessed from the outcome of B potash feldspars is caused by hot water.

And we thought by the result of A,B,C that Mt.shinobuyama is all configured by tuff, and hot water intruded west side of Mt.Shinobuyama and its quartz and potash feldspar became crystal. It support the hypothesis that Mt. Shinobuyama is configured by tuff.

6. Perspect

This time, we conducted the research the formation of Mt.Shinobuyama with checking truth or error of existing study. In this research, Mt.Shinobuyama's texture is different in east and west and intruded hydrothermal water in the west, which seems to be formation factor. Making these clear, we need to investigate Fukushima basin from now on.

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