

## The relationship of smectite crystal shape and growth rate

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To evaluate the volcanic glass alteration, smectite shapes were observed by SEM. Smectite was crystallized on volcanic glass surface. We recognized 5 criteria for the smectite morphological shape.

- 1, very young glass, erupted 100 year to 1000 year ago
  - no smectite on glass surface.
- 2, 30000 to 40000 year
  - scattered smectite-aggregation formed less than 1 micron dumpling sphere.
- 3, 90000 year
  - smectite-aggregation connected each 1 ? 2 micron dumpling sphere.
- 4, 120000 year
  - smectite-aggregation which developed the blade, formed 1 ? 2 micron sphere.
- 5, older
  - smectite-aggregation with the blade, covered glass surface.

These morphological changes were found from pyroclastic rocks (pumice flow and fall deposit) collected from Hokkaido and Kyushu region. We hope to produce a good result to understand the time scale of the water ? rock interaction by the smectite morphological changes.

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