

Submarine explosive eruption of middle Miocene basaltic scori agglomerates focused on their vesiculation textures.

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Volcanic successions were determined for some middle Miocene submarine volcanoes in Niigata region. Vesiculation texture, population density and vesicularity of juvenile clasts in pyroclastic rocks were also examined for them, in comparison with those of associated pillow lavas from the same horizon. Two points were ruled out; one is that scoria agglomerates, which were formed by submarine explosive eruptions, generally overly pillow lava with the same petrography and geochemistry. The other is that glassy rims of pillow lavas are characterized with large vesicles and low vesicle number (per unit area), while juvenile clasts of scoria agglomerates are highly enriched in small vesicles. The vesiculation density is similar to those of Kilauean lava fountains.

It is suggested that slow rise of vesiculated magma erupted to make a pillow lava at the beginning of a series of eruption. When a new magma injected into the chamber, magma was accelerated in a vent. Reheating of the residual magma and decompressional opening of the vent might have facilitated second bubble nucleation. Vesiculation itself also accelerated magma to ascend. Eruption style merges into explosive, and lava fountain is formed below the sea level. Large amount of pater clasts were formed from it, and were hydroclastically disintegrated into scoria lapillis, instead of a formation of clastogenic lava on land. Thus the thick scoriaceous pyroclastic rocks are sedimentated covering pillow lavas in the submarine environment.