

Estimation of temperatures of Holocene pyroclastic flow, surge and debris avalanche deposits from Sambe volcano, Japan

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Mt. Sambe is the youngest volcano in the Chugoku district. Emplacement temperatures of late Holocene pyroclastic flow - surge and debris avalanche deposits were estimated from unblocking temperatures of magnetization in clasts and H/C thermometry of carbonized wood fragments. Dacites are divided into three groups based on the properties of their magnetic minerals: (1)containing titanomagnetite - magnetite (Curie temp.=500-590deg.C), (2)hematite -maghemite (620-650deg.C)and iron sulfide (200-250deg.C), (3)hemoilmenite (self-reversal: 250-350deg.C). The pyroclastic flow travelled as far as 6km from its source in the Taiheizan pyroclastic cone. Estimated emplacement temperatures of the pyroclastic flows reach up to 560deg.C even at the most distal site. However, the pyroclastic surge associated with the pyroclastic flow travelled further. Emplacement temperatures estimated from dacite clasts show temperatures of more than 590deg.C at a site 6.5km from the source. Drill core samples (50m depth) in the northern part of the Osambe dacite domes consist of brecciated lava. From drill core, matrix to clast ratios in Tateishi debris avalanche deposits increase with distance, and estimated emplacement temperatures of clasts decrease from more than 590deg.C to less than 250deg.C. It is inferred that the Tateishi debris avalanche was triggered by ascent of the hot dacite lava dome, and was caused by collapse of this edifice.