

Textural heterogeneities of pumice on Ulleung island, Korea and its implications for magma vesiculation

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Plinian volcanic activity produces various kinds of pyroclasts including pumice and ash caused by very explosive eruptions. At the Ulleung volcano located in the southwestern part of the East Sea in Korea, volcanic activities from 18,800 to 5,600 cal BP gave rise to abundant pumices as a result of Plinian eruptions [1] [2]. Among these eruptions, volcanic materials known as U-Oki tephra include vesicular white to gray pumices and ash. The goal of this research was to elucidate textural heterogeneities of pumice from the volcanic eruption (9.5 cal ka BP). We chose representative white and gray pumice samples (microvesicular and tube pumice) using morphological features and vesicle texture.

Pumice samples are trachytic to phonolitic in composition. It can be classified into poorly, moderately, and highly vesicular based on classification of vesiculation [3]. Vesicle size distributions are typically polymodal and their shapes also vary. The microvesicular pumice consists of spherical, oval, and channel-like vesicles showing pore throats in all directions. They coexist with partly stretched vesicles. On the opposite, tube pumice have entirely very stretched vesicles with extreme degree of vesicle elongation and alignment. Two type samples show various steps of textural development in terms of vesicles size shapes and distribution. Based on the previous studies and our results, we will discuss the various steps of bubble growth and development of these textural heterogeneities occurring in the volcanic conduit and then propose a simple schematic representation.

[1] Okuno *et al* (2010) *Radiocarbon* **52**, 1465-1470. [2] Im *et al* (2012) *Geosciences Journal* **16(2)**, 105-114. [3] Houghton and Wilson (1989) *Bull Volcanol* **51**, 451-462.