Geophysical Research Abstracts, Vol. 8, 05605, 2006
SRef-ID: 1607-7962/gra/EGU06-A-05605


# COMPARING VESICULARITY IN PYROCLASTIC DEPOSITS

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The investigation of processes associated with explosive volcanism requires the knowledge of the physico-chemical properties of the rock material involved. Parameters such as density and vesicularity highly influence the rheological properties as well as the fragmentation behavior of magma. Because observations inside the volcanic conduit are not possible, information on the spatial and temporal variability of the ascending magma's vesicularity is more easily obtained by measuring the density of a statistically reliable amount of representative erupted material. Densities from $\sim$3000 pyroclastic-deposit samples collected on St. Augustine (Alaska), Bezymianny (Kamchatka), Unzen (Japan), Colima (Mexico), and Merapi, Krakatau and Kelut (Indonesia) were mostly measured directly in the field. This field-based density measurement method is based on the Archimedean principle whereby a sample's mass is measured in air and under water (Kueppers et al., 2005). Samples collected from the 1883 Krakatau pyroclastic deposits during our most recent campaign follow a much lower density distribution than most of the other volcanoes investigated in this study and show a bimodal distribution (peak densities of 0.1 and 0.5 g/cm$^3$). This suggests that the erupted material had a higher gas content. Because the amount of volatiles exsolved and trapped in a magma partly controls the eruptive style of a volcano, density distributions will be discussed in terms of magma vesicularity within the volcanic conduit or dome. This comprehensive work is part of the BMBF project SUNDAARC, which aims to quantify the potential risk of selected highly-explosive volcanoes by combining field and laboratory investigations.