



Genetic mechanism of hornitos in Wudalianchi Volcanic Field, Northeast China

Weiyan GAO, Jianghai LI, Xiang MAO, and Tianran ZHANG

School of Earth and Space Sciences, Department of Geology, Peking University, Beijing, China, 100871 (gwy_pku@163.com, 86-10-62751153)

Hornitos are kind of chimney-like structures forming on the lava flow surface, which are discovered in America, Mexico and other places in the world. Wudalianchi volcanic field in northeast China, one of worldwide the most typical intracontinental volcanos, have perhaps the most abundant hornitos on basic lava flows. There are at least 1537 well-preserved hornitos discovered in Wudalianchi Volcanic field, majority of which distribute in lava flows of a newly-built volcano erupting in 1719-1721. Especially, lava plateau with sufficient water has hornitos concentrated distributed, in the largest scale and best developed. After morphologic and concentrated distribution characteristic analysis, it comes to the conclusion that water vapor in mixed gas is dominant in the formation of hornito, and gravity is also of some importance to shape a hornito. When the basic lava with volatile overflowed near to water area, the surface of lava condensated and consolidated while inside remained high temperature and low viscosity. Mixed gas containing volcanic gas and vapor started to aggregate after lava meeting groundwater, and intermittently broke surface of lava to escape, together with some lava spattering up and stacking around the vent to form a hornito, the inside of which stayed hollow as the routeway for gas to escape. When air pressure failed to eject lava from top jet, growth of a hornito ended. So, hornito is produced by the interaction of water with the hot flowing lavas, and its genetic mechanism manifests an important example of lava landform in continental basic basalt area.

Key Words Wudalianchi volcanic field; Hornito; Basic magma; Viscosity; Water vapor