Geophysical Research Abstracts
Vol. 20, EGU2018-2254, 2018
EGU General Assembly 2018

Integration of Surface and Subsurface Volcanostratigraphy of Small Mt. Hasan and Keçiboyduran Stratovolcanoes (Central Anatolia)

Ayşe Zeynep Çalışkanoğlu and Şafak Altunkaynak
Turkey (caliskanoglu@itu.edu.tr)

In this study, we document the volcanostratigrapy of Small Mt. Hasan and Keçiboyduran volcanoes obtained from integration of petrogragraphy, surface geology and the drilling data from Saadet 1 well conducted between these volcanoes by 3S Kale Energy Production Inc., in order to evaluate the nature and evolution of the volcanic sequence of 2500 m in thickness.

Integration of subaerial geology and subsurface log data shows that the basement rocks of the sequence are represented by sedimentary rocks. Sedimentary rocks are formed from intercalated sandstone, limestone, marl and mudstone. The thickness of sedimentary sequence reaches about 500m and they gradually pass into epiclastic rocks represented by reworked pyroclastic airfall and flow deposits towards to upper part of the sequence. Volcanic sequence consists of 7 distinct lava phase that are separated by 6 volcanoclastic and pyroclastic zones. At the base of the volcanic sequence, there are basaltic lavas belonging to Small Mt. Hasan volcanites. Basalts pass into to basaltic andesite, andesite and related pyroclastic rocks. Rhyolite lavas and associated pyroclastic airfall, flow (welded and unwelled ignimbrite) and debris deposits dominate the volcanic sequence towards to the upward. These are alternated with andesite and dacite lavas of Keçiboyduran volcano. The top of the volcanic sequence is represented by olivine basalts, which are the last products of Small Mt. Hasan volcano.

Mt. Hasan and Keçiboyduran volcanoes are partly coeval stratovolcanoes which are built upon a shallow lake environment. They are stratovolcanoes formed by the alternation of lava flows and pyroclastic layers. The volcanoes began to form with fissure eruptions producing early pyroclastic rocks. The volcanoes built a cone and crater when the volcanic activity intensified with plinian subplinian eruptions represented by mafic-intermediate to felsic lavas and associated pyroclastic rocks. Central vents of both volcanoes align along NW-SE direction which parallel to the major structural elements (e.g. Salt Lake Fault) of the region. Volcanic eruptions forming these stratovolcanoes started with explosive eruptions and then changed into the effusive activity producing olivine basalts during the evolution of Central Anatolian continental volcanism in Plio-Quaternary.

Keywords: Central Anatolia, Small Mt. Hasan, Keçiboyduran, Surface and Subsurface volcanostratigraphy