

Understanding the volcanic activity at Popocatepetl Volcano, Mexico from 1997 to 2010

Julie Roberge¹, Severine Mouné², Angel Briseno-Arellano³

¹ESIA-Ticomán, Instituto Politécnico Nacional (IPN), Mexico, ²Laboratoire Magmas et Volcans, Université Blaise Pascal, Clermont Ferrand, France, ³Facultad de Ingeniería, UNAM, Mexico

E-mail: robergejulie@gmail.com

Popocatepetl volcano located southeast of Mexico City has been the site of open vent degassing since late 1994. The products of these eruptions show evidence of a mixture of siliceous and mafic magmas shortly before eruption. We present a qualitative analysis of the activity of Popocatepetl from 1997 to 2010 based on the daily reports from CENAPRED (National Center for Disaster Prevention). The daily reports are a compilation of the number of gas/gas and ash emissions and number and intensities of tremors and volcanotectonic earthquakes events. Gas and ash emissions, tremors and volcanotectonic earthquakes were plotted in number of events against time for each month, year and the total of the years studied. In addition, the earthquakes were further characterized according to their intensity and location around the volcano. All the combined data display trends showing that the volcanic activity increases at the end of each year and gradually decreases in March, with even lower activity during the summer. In January 2010, videos of the degassing activity were taken while measuring SO₂ fluxes with a DOAS (Differential Optical Absorption Spectroscopy). The video clearly shows two types of degassing: 1) diffuse degassing from the central vent of the volcano where the lava dome is emplaced, and 2) jet-like degassing from fumaroles at the Eastern side of the crater. These fumaroles form a degassing site with very rare lava emission. It was observed that when the degassing activity intensifies at one site, it decreases at the other. However, preliminary data indicate similar SO₂ fluxes which imply that the source of gas is the same for both types of degassing activities and only the emission site changes.