



Supplemental Figure 1. X-ray diffraction patterns for acid-sulfate altered fumaroles deposits containing Fe-bearing natroalunites from Cerro Negro, Telica, and Masaya volcanoes, Nicaragua. Identified peaks include natroalunite (n), gypsum (g), kaolinite (k), plagioclase (p), augite (aug), and magnetite (m?; tentative identification). The broad hump centered around ~21.8° apparent in several samples is attributable to amorphous silica.