ABSTRACT

Chemical and mineralogical characterization using scanning electron microscopy, IR, and DRX of volcanic rocks for water treatment.

This study, the chemical and mineralogical characteristics of the volcanic rocks of Chimborazo, Tungurahua, Reventador, and The Altar are proposed, applying elemental analysis characterization techniques (Photon Energy Spectroscopy - X-ray Fluorescence) and mineralogical analysis (Diffraction X-ray - Fourier Transform Infrared Spectroscopy). The results showed that volcanic materials share certain elements in common, and due to the presence of oxygen, they are forming metal oxides of Si, Al, Fe, Ca, K with different concentrations. The main metallic oxides are Si and Al, the one with the highest concentration is Chimborazo (55.70% SiO_2 - 17.40% Al_2O_3), followed by Tungurahua (51.20% SiO_2 - 19.80% Al_2O_3), The Altar (48.60% SiO_2 - 11.76% Al_2O_3) and the Reventador (38.10% SiO_2 - 13.40% Al_2O_3, being the main mineralogical phases: Andesine, Quartz, and Anortoclase for the Chimborazo volcano, the Tungurahua by Albite, Anortite and Anortoclase, The Reventador by Albite, Anortoclase and Anortite and The Altar by Albite, Wuesite, and Anortoclase. The presence of different amphoteric metal oxides indicates the alternative of using these igneous materials in natural and wastewater treatment, thanks to their ion exchange and adsorption characteristics and properties.

Keywords: volcanic rocks, chemical characterization, mineralogy, load, DRX, FTIR.

Abstract translation reviewed by Dr. Narcisa Fuertes PhD.
Professor at Competencias Linguísticas UNACH.