World Academy of Science, Engineering and Technology
International Journal of Environmental and Ecological Engineering
Vol:12, No:10, 2018

Environmental Geochemistry of Natural Geysers in an Urban Zone of Mexico

Authors : Zayre I. Gonzalez-Acevedo, Marco A. Garcia-Zarate

Abstract : Environmental pollution by heavy metals is due to several processes, whether natural as weathering, or anthropogenic, related to human activities. Geysers may content dissolved heavy metals, related with their geothermal origin, and they are widely used by local people and tourists for treatment of dermal diseases and other therapeutic applications. In this study, 20 geysers with temperatures between 32 to 94 °C, located in the vicinity of Queretaro and Guanajuato in Central Mexico, were studied. These geysers were sampled in dry and rainy seasons in order to investigate seasonal changes of trace elements. The samples were analyzed in SWAMP Lab, University of Alberta, Canada for 34 elements. Most of the analyzed trace elements sowed concentrations below guidelines for natural waters. The elements showed seasonal variability with higher concentrations during rainy season. Arsenic varied from 49.29 to 2.16 µg L^{-1}. Arsenic was highly correlated with Fe, Sr, Th and Tl. Barium varied from 93.52 to 1.79 µg L^{-1}. Barium was highly correlated with Co, Cr, Mo, Ni, U, V, and Y. Copper and Zinc were correlated as well. According to the comparison of sites and the correlations between trace elements, their source was identified as natural regional, geothermal or anthropogenic origin. Because of application of geyser's water to balneology and health treatments, and also, because they are located in an urban zone in development, advise on their direct uses, according to their environmental quality is appointed in this research.

Keywords : balneology, direct uses, environmental quality and trace elements
Conference Title : ICHMC 2018 : International Conference on Heavy Metal Contamination
Conference Location : New York, United States
Conference Dates : October 08-09, 2018