

## **The August 2016, Popocatépetl volcano eruption episode. Hazard estimation form ash leachates.**

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Since 1994, Popocatépetl volcano started a sustained eruption process that has been characterized by a succession of dome emplacement and destruction episodes, that have changed the depth, and shape of the crater bottom. This ongoing activity has included intermittent emissions of ash posing a hazard to the environment, and to about 20 million people living within 100 km from the volcano. Chemical analyses of ash leachates performed since 1994 have shown variations with time and with the distance of settled ash. In August 1st, 2016, many areas of Mexico City were covered by a thin ash blanket. Ash layers of variable thickness also covered other locations around the volcano. Concentrations of the main ions in aqueous leachates of ash samples revealed a fluoride content of 375 mg/kg, which is within the highest values measured so far. People have been advised about the potential health hazard of ash, and authorities repeatedly recommend covering water deposits. However, animals may be at risk of drinking contaminated water. About 4 g of ash settled in one liter of water would make it unsuitable for human consumption (or animal, depending on species and weight) due to fluoride concentration. Apart from the environmental effects of ash, it is important to identify the nature of the activity causing the ash emissions. The relative concentrations of fluoride, sulfate and chloride provide an indicator of the degree of juvenile magmatic contribution or of an increased phreatic component of the ash emissions, contributing to resolve the source of the emissions: dome growth or dome destruction, and thus the hazard scenarios. At Popocatépetl, four ash-leachate chemical groups have been identified and related to specific eruption characteristics producing the ash emissions (Armienta et al., 2010). The analysis of the August, 2016 leachates revealed a composition corresponding to a lava dome extrusion episode.