

# ASH LEACHATES FROM THE 1991 ERUPTION OF PINATUBO VOLCANO. INSIGHTS INTO THE GAS CHEMISTRY OF THE ERUPTIVE COLUMN.

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Leachate experiments were conducted on ash samples from the June and July 1991 eruptions of Pinatubo volcano. The samples were leached with deionized (milliQ) water and analyzed for the main anions (F, Br, Cl and SO<sub>4</sub>) by HPLC and cations (Na, K, Ca and Mg) by AAS. Trace elements (Cu, Zn, Se, As, Tl) were analyzed by ICP-MS. The close correlation existing between Na and Cl and Ca and SO<sub>4</sub> suggests that NaCl and CaSO<sub>4</sub> are the main salts adsorbed on the ash particles. This is in agreement with the very fast dissolution rate of Na and Cl observed during the leachate experiments. A large part of the Ca and sulfate in the leachate solutions is derived from the dissolution of primary anhydrite microphenocrysts, but a significant fraction (35%) of sulfur gases was also adsorbed on ash particles during the convective rise of the eruptive column into the stratosphere. Na/K ratios observed in the leachate solutions are likely to be the consequence of acid-attack of plagioclase phenocrysts of the Pinatubo dacite with a minor contribution of volcanic glass. There is a close correlation between the amount of salts adsorbed on the ash particles and the surface area of the samples. This could have an important implication when evaluating the total volume of gases adsorbed on an ash fall deposit. The total amount of HCl adsorbed on ash particles for the June 15 eruption is estimated to be 0.5MT, roughly 10% of the total amount of HCl degassed by the Pinatubo magma. The  $\delta^{34}\text{S}$  isotopic compositions of the ash leachates tend to show that the breakdown of primary anhydrite phenocrysts is not a likely source for the excess of SO<sub>2</sub> gas released by the Pinatubo eruption.