**ELEMENTAL AND ISOTOPIC SYSTEMATICS OF CHLORINE AND OTHER ELEMENTS (B, LI) IN GEOTHERMAL FLUIDS OF MEXICO**

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To evaluate the sustainability of geothermal resources is pivotal to understand the sources of fluids within the system. This can be revealed by the geochemistry of the solid charge (major, minor and trace dissolved elements including conservative Cl), the dissolved gases (H2S, CO2, N2, Ar, He) and their isotopes (H, O, C, S, Cl, Br, B and noble gases). Chlorine is a conservative fluid-mobile element in high-enthalpy magmatic-geothermal systems, and it is the main anion in geothermal brines. Its origin is multiple, from magmatic HCl, water-rock interactions, seawater chlorine and porewater chlorine, possibly from subducting material in volcanic arc-related systems. Together with Li and B can be helpful in deciphering the origin of associated hot fluids. The interest of looking to the sources, mobility, and enrichment of Li in geothermal fluids is also dictated by the potential exploitation of this critical element for energy transition from geothermal brines. Here we present data of elemental Cl, B and Li together with 99 new δ11B data and compared to the large isotopic dataset obtained during the years (H, O, Cl, Br, S, C, Sr and noble gas isotopes) from three of the four geothermal fields exploited by the *Comísion Federal de l’Electricidad* in Mexico which are located in different geodynamic contexts and geological reservoirs: Cerro Prieto (CP hereafter) and Las Tres Vírgenes (LVT) located in Baja California in an extensional context related to the opening of the Gulf of California; and Los Azufres (LA) located in Central Mexico in a collisional context related to the subduction of the Cocos Plate. Further, Cerro Prieto reservoirs is sedimentary, related to the Colorado River delta, while the other two fields are located within magmatic (granites) or volcanic (andesites) reservoirs. The Cl/B weight ratios are very homogeneous for each field and distinct as expected in liquid-dominated geothermal fields, suggesting homogenized sources in fluids. The Cl/B ratios range from 784 for CP, which is much larger of those measured in LVT and LA (10-50). The last values are within those expected from Cl and B extracted from unaltered magmatic rocks during water-rock interaction, while CP values could be a mixing between either this source and seawater (Cl/B = 4360) or seawater and volcanic Cl (Cl/B =700±200). The δ11B values range from -7 to +10‰ vs standard NIST SRM951a and plotted against the 87Sr/86Sr, other tracer of water-rock interactions and fluid sources. Results suggests that LA and LVT B is derived from magmatic sources or weathering of E-MORB-type basalts while CP is derived from local sediments, seawater and another source which could be either a mixing between magmatic and seawater fluids or indicating a contamination from subducted sediments (paleo-Farallon Plate) which seems to affect the chemistry of fluids in Baja California. Interestingly this source is accompanied by large amount of radiogenic 4He. Cl/Li weight ratios varies between 884 and 147 which are between those of seawater and unaltered magmatic rocks with Li content of 30 ppm, much less than those of closely located Salton Sea field (220 ppm) or those found in several locations in Europe (125-440 ppm). Sr/Li vs 87Sr/86Sr suggest similar Li sources than B.