VOLCANOLOGY AND PETROLOGY OF HUDSON VOLCANIC COMPLEX (CHILEAN PATAGONIA, 45°54’ S): PETROGENETIC AND GEODYNAMIC IMPLICATIONS.

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We report new volcanological and petrological data on the Hudson Volcanic complex (HVC), scarcely known for its inaccessible location in the southern Andes of Chile at 45°54’ S and 72°58’ W. It lies about 280 Km east of Nazca-Antarctic-South American plate triple junction, where the Chile spreading ridge enters the Chile trench. It is the southernmost volcano in the South Andean volcanic zone (SVZ). It consists of a circular volcano tectonic depression about 10 Km wide, hosting a glacier, set in the granodioritic Cretaceous Patagonic batholith. Lahars and hyaloclastites intercalated to lava flows are found on the rim and out of the calderic depression. Two plinian eruptions are recorded in the last thirty years. At least four monogenetic spatter cones belong to the volcanic complex. The volcanic structures are linked to the Liquini-Ofqui dextral transcurrent fault system (LOF). The volcanic products of Hudson have a calc-alkaline signature with a composition ranging from basalts to dacites. The Hudson products have higher K2O, TiO2, Na2O, LILE, HFSE and REE than the calc-alkaline rocks of SVZ. The lavas from the monogenetic cones are the most primitive of the complex and are enriched in P, Ti and some trace elements as REE, Zr, Nb, Hf and Y in respect to the calc-alkaline rocks of SVZ but depleted in these elements in relation to Hudson basalts. The magmatological frame of this area, dominated by the LOF lithospheric structure on the active volcanic arc and by the vicinity of the slab window associated to subduction of the Chile ridge, is quite complex and characterised by magma sources of distinct nature. The occurrence on the Quaternary
volcanic arc of typical SVZ calc-alkaline magmas and of sporadic OIB-type magmas reflects this complexity. The HVC primitive basalts could derive by partial melting of a mantle source modified by oceanic sediments and altered oceanic crust. Fractional crystallization plus slight assimilation of continental crust in magma chambers, can explain the evolution of the Hudson magmas. This frame has permitted to propose a geodynamic model of Southern Andes at 45° S.