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Genesis and industrial Potential of Kaolinite from the Santa Angélica Kaolin Deposit, Patagual Area, Biobío Region, Chile

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The Santa Angélica Kaolinite deposit (SAKD) is located in the Patagual-Coronel area of the Biobío Region. The area is underlain by the Eastern Metamorphic Series represented locally by the Patagual-El Venado Unit; a very low grade metamorphic sequence of metasamites interbedded with metapelites and white to greenish layers of clay. Over this unit, in nonconformity lies the Santa Juana Formation represented here by conglomerates with fine layers of sandstones and shales with abundant fossil flora. The SAKD outcrops on a gentle to medium slope between 255 and 285 masl, over the Santa Juana Formation and preliminary field work indicates that the SAKD could be over 8 m thick and extend to a greater distance, even out of the property boundaries. The whole area is stacked and deformed by Cenozoic tectonic activity which could be responsible for the high altitude location of the SAKD. The lack of intrusive bodies in the area and the geometry of the deposit suggests that it has an epigenetic origin. Preliminary x-ray diffraction data indicate that the mineralogy is mainly quartz, kaolinite, muscovite, albite and minor sodalite, clinochlore and faujasite. SiO_2 and Al_2O_5 contents are relatively high (70,2 and 21,4 % wt.) compared to very low Fe_2O_3 contents (0,74 % wt.). Former small scale mining and extraction of kaolin for the Lozapenco Factory indicates that the kaolinitic clays of this deposit are suitable for industrial ceramics, but we still have to test properties such as particle sizes, plasticity, and firing shrinkage to evaluate other industrial potential for these clays.