GRANITIC ROCKS AS A SOURCE OF K_2O + Na_2O FOR CERAMIC APPLICATIONS IN BOLIVIA

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Based on geological mapping, sampling and mineralogical/petrological characterization, significant feldspar resources have been defined in Quimsa Cruz intrusive in the Choquetanga area and in the Sorata intrusive in the La Fabulosa area, Eastern Range, Bolivia. The petrographical studies performed on the samples show a granitic composition and the feldspar resources are hosted by granites in the Choquetanga area and in granitic pegmatites in the La Fabulosa area.

The potential of feldspathic rocks as a raw material for the ceramic industry is largely dependent on the alkali content present in the feldspars. Feldspars are used in ceramic industry for manufacturing of glass and pottery, both in the body of the ware and in the glaze, providing alumina (JENSEN & BATEMAN, 1979), and in the fine ceramic industry as a flux to form a glassy phase in the ceramic bodies, thus promoting vitrification and translucency. However, feldspars are also used as a source of alkalis and alumina in glazes (POTTER, 2006). The content of feldspars in ceramic goods varies between 15 and 80 wt% depending on the finished product (SINGER & SINGER, 1963). For sanitary ware (bathroom fittings) manufacturing of ceramics requires a significantly higher amount of feldspars (25–35 wt%) than in most other ceramic bodies. For example, wall and floor tiles industry uses 10–55 wt% feldspars for the finished products (HUGHES, 2006). Aplites, alaskites, granites, sands and pegmatites are commonly regarded as potential sources of feldspar (BATES, 1983; POTTER, 2006).

The ceramic industry in Bolivia has been growing in the last few years, more and more feldspathic raw material is needed and most is imported. The deposits were studied with focus on the feldspar content and in order to evaluate the quantity and quality of feldspars.

Figs. 1A and 1B show the texture, grain size and mineralogical composition of the samples. The results of the chemical analyses carried out by ICP show a ΣK_2O + Na_2O content of 7.84 wt% for Choquetanga samples and 14.25 wt% for La Fabulosa specimens, thus providing an alternative source of alkalis in both deposits.

References

BATES, R. (1983): Industrial minerals and rocks, 5(1): 711–722.
HUGHES, W. (2006): Minerals and metals availability in New South Wales Australia. 28.
JENSEN, M. & BATEMAN, A. (1979): Economic mineral deposits, 3: 496–505.
POTTER, M. (2006): Feldspars – Industrial Minerals & Rocks, 7: 451–460.
SINGER, F. & SINGER, S. (1963): Industrial Ceramics. New Delhi, India: Oxford and IBH.

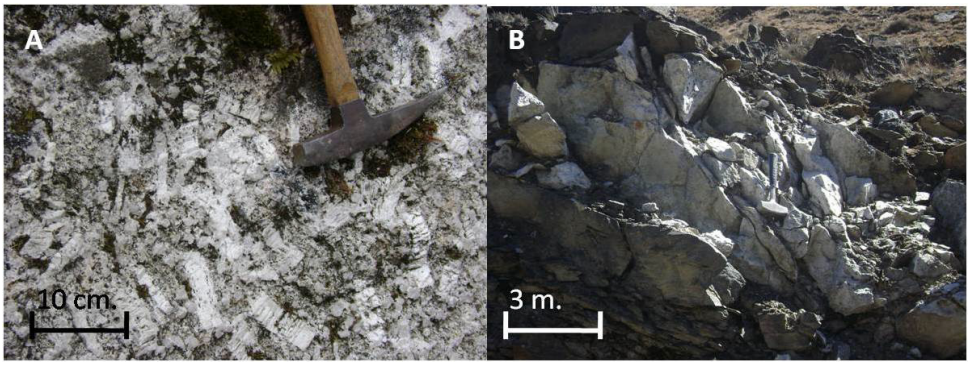

Fig. 1. Photographs of rock types in the studied areas. A) Choquetanga area: Feldspar bearing granites with typical orientation of feldspar megacrysts (5–10 cm in size); B) La Fabulosa area: The fine-grained granitic Sorata intrusive is surrounded and intruded by multiple pegmatitic dykes.