

## COMPOSITION AND GENESIS OF THE OPHIOLITIC ROCKS AND ASSOCIATED CHROMITE DEPOSITS IN THE MOA-BARACOA MASSIF, EASTERN CUBA

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### ABSTRACT

Composition of the rocks and minerals forming the Moa-Baracoa ophiolite massif are being studied in detail. The chromite deposits being studied in the area are those of Cayo-Guan, Potosí and Mercedita. Mineral compositions have been determined using the electron microprobe analyser. The mantle sequence is dominated by harzburgite with dunite mainly confined to envelopes surrounding the chromite deposits. Cumulate sequences are common and include dunites, wherlites, troctolites, olivine gabbros, anorthosites and gabbro-norites. Mantle rocks and segregated chromite masses are cut by dikes of gabbro and troctolite composition of normal grain size, but also by dikes of gabbro pegmatite which have brecciated the chromite. Platinum group minerals occur in the Potosí area and were mainly introduced with the sulfide veining when the rocks were fractured at the time of intrusion of the gabbroic dikes.

Chromite ore (chromitite) from the Moa-Baracoa area is of the refractory type and has a narrow range in composition  $\text{Cr}/(\text{Cr}+\text{Al}) = 0.44\text{--}0.52$ ;  $\text{Mg}/(\text{Mg}+\text{Fe}) = 0.66\text{--}0.76$ . This is in contrast to the metallurgical grade chromite from the Pinares de Mayarí area to the west ( $\text{Cr}/(\text{Cr}+\text{Al}) = 0.69\text{--}0.81$ ). However, each deposit has a unique composition.  $\text{TiO}_2$  in most massive chromite (chromitite) is  $<0.46\%$ , but in chromitite in brecciated gabbro pegmatites (Potosí and Cayo-Guan),  $\text{TiO}_2$  ranges from  $0.49\text{--}1.4\%$ . High  $\text{TiO}_2$  chromitite is commonly iron-rich ( $\text{Mg}/(\text{Mg}+\text{Fe}) = 0.56$ ;  $\text{Fe}^{3+}/\text{Fe}^{2+} = 0.58$  and contains rutile inclusions. The variation in composition of these chromites is being studied in detail. Disseminated chromite in associated dunites (dunite envelopes to chromite ore) shows the same  $\text{Cr}/(\text{Cr}+\text{Al})$  ratio as in chromite ore (massive chromitite), but has a lower  $\text{Mg}/(\text{Mg}+\text{Fe})$  ratio of  $0.66\text{--}0.58$ , slightly higher than that of chromite in harzburgite. Olivine in massive chromite is considerably more Mg-rich ( $\text{Fo } 0.95\text{--}0.96$ ) than in associated mantle rocks ( $\text{Fo } 0.89\text{--}0.92$  in harzburgites).

All of the above features are characteristic of the ophiolitic rocks associated with refractory (high Al) chromite deposits throughout the world and contrast with the (high Cr) chromite deposit association such as at Pinares de Yamarí to the west. It is considered that compositions of minerals in the ophiolites and associated chromite deposits (particularly the Cr/Al ratio) are determined primarily by the degree of partial melting. Magma fractionation at more shallow levels probably further controlled the variation in composition of the chromite, particularly the Ti/Mg # ratio.