APPLICATION OF AN INNOVATIVE BENEFICIATION TECHNIQUE TO KRASTA CHROMITE ORE (ALBANIA) FOR THE PRODUCTION OF HIGH GRADE – LOW SILICA CHROMITE SAND

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The Mirdita ophiolite is located in the northern ophiolite belt of Albania. Based on differences in the internal stratigraphy and chemical composition of the crustal units, two types of ophiolites have been recognized in the Mirdita ophiolite, namely the Western Mirdita Ophiolite (WMO) and the Eastern Mirdita Ophiolite (EMO) (DILEK *et al.,* 2008). Boninitic dikes and lavas crosscut and/or overlie the older extrusive rocks in the EMO (BECCALUVA *et al.,* 1994). The crustal section of the WMO has MORB affinities, whereas that of the EMO predominantly shows SSZ geochemical affinities. The extrusive sequence in the EMO consists of pillowed to massive flows ranging in composition from basalt and basaltic andesite in the lower section to andesite, dacite, and rhyodacite in the upper part (BORTOLOTTI *et al.,* 1996). Large peridotite massifs are exposed at the western and eastern ends of the Mirdita ophiolite. Plagioclase-bearing peridotites are frequently observed in the WMO, whereas harzburgite is dominant in the EMO (BEQIRAJ *et al.,* 2000).

In this work, we focus on Bulqiza peridotite massif located in the EMO, because it has economically important chromite ores. Chromite is an important mineral used in the metallurgy, chemistry and refractory industries and often requires enrichment processes to achieve the chemical parameters for different markets.

This work deals with disseminated chromite ore samples collected at Krasta Mine, located in the central southern part of the Bulqiza Massif. First of all the samples, having an average Cr_2O_3 content of 23.66 wt%, were enriched using spirals and shaking tables at Krasta plant. The first chromite sand concentrate has 46.58 wt% Cr_2O_3 and 10.35 wt% SiO_2. In order to meet the very demanding chemical parameter requirements for refractory market, chromite first concentrate sand was re-enriched using a combination of dry magnetic and gravity separation at the pilot plant of Omega Foundry Machinery Ltd. in Peterborough (UK). In a second step sand was enriched using a drum magnet. New concentrate was then enriched in a third step by means of an Inclined Fluidised Separator (IFS) that works in dry conditions using an air cushion as fluidisation agent.

Preliminary results show that the pilot plant is able to strongly re-enrich the primary concentrate sand, producing a final concentrate sand with up to 60.01 wt% Cr_2O_3 and 2.43 wt% SiO_2 with a tail that is still suitable for the steel market (Fig. 1).

References

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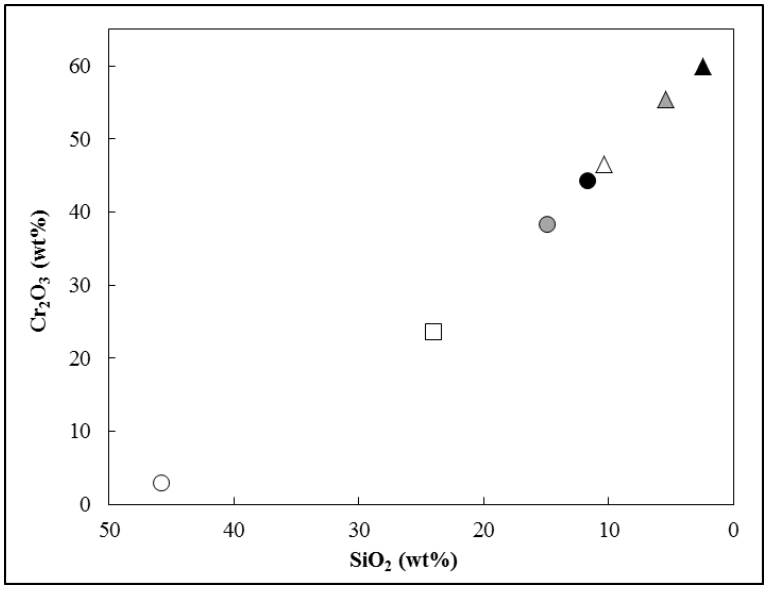

Fig. 1. Three steps Krasta chromite ore enrichment: spirals and shaking tables at Krasta plant (white symbols), drum magnet (grey symbols) & IFS (black symbols) at Peterborough pilot plant. Square = feed, triangles = concentrates and circles = tails. First and second concentrates are the feeds of the following steps.