CERAMIC RAW MATERIALS FROM THE GILĂU MTS. (ROMANIA)

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Three well-known deposits from the Gilău Mts. (North Apuseni Mts., Romania), *e.g.* pegmatitic granite from Bedeci (source of feldspar and quartz), pegmatites from Muntele Rece (source for feldspar) and quartzites from Mănăstireni (source for quartz) are presented. They are used as raw materials for obtaining high quality household porcelain. The Bedeci raw material represents the Muntele Mare granite (composed from quartz, plagioclase, orthoclase, muscovite and biotite), intensely affected by late metasomatic processes which formed albite, microcline and generated pegmatitic granite. The pegmatite bodies from the Muntele Rece area are constituted from feldspars and quartz in various ratios so that three different petrographic types could be identified: orthoclase, plagioclase and orthoclase-plagioclase pegmatites. The Mănăstireni quartzite bodies, almost monomineralic in composition, have a hydrothermal origin related to the Muntele Mare granite.

The sequence of the processing phases used for the above-mentioned raw materials, are as follow: crushing and grinding, sieving and micas flotation, weak-field magnetic separation, feldspars flotation, drying, strong-field magnetic separation, final grinding. Several sorts of concentrates intended to be used for producing ceramics, tiles, electroceramics, glass, binders, glazes, enamels, ceramic pigments represent the results of these technological phases. Among them, the so-called *feldspar FC* concentrate is outstanding due to its chemical, mineralogical and technological characteristics. It is produced by processing a single raw material, *i.e.* the Bedeci pegmatitic granite, containing both feldspar and quartz. Granulometrically, this concentrate presents a bimodal distribution of the grains with two maxima, at 5 μm and 11 μm respectively; 80% of the particles have diameters below 63 μm. The chemical composition of the *feldspar FC* concentrate is: 78.1% SiO_2, 12.23% Al_2O_3, 0.26% Fe_2O_3, 0.5% MgO, 1.5% CaO, 3.8% Na_2O, 3.3% K_2O, and 1.02% LOI. The XRD patterns show the presence of quartz (40%), plagioclase, *i.e.* albite and oligoclase (39%), potassium feldspar, *i.e.* microcline (17%), and muscovite (4%).

Several recipes for producing household porcelain were tested, including domestic and imported raw materials, by firing at 1360 °C. The study shows that the porcelain made from recipe A (kaolinite + *feldspar FC* concentrate) compared with the porcelain obtained from recipe B (kaolinite + imported feldspar + domestic sands) has superior characteristics. Microscopically, the A-type porcelain is composed from 87-89% vitreous-microcrystalline matrix and 11-13% clasts of quartz, rare biotite and other minerals. The firing minerals are represented mainly by mullite, rare cristobalite and spinel. The amount of glass is over 50%, mullite reaches up to 39-40%, while quartz represents 9%. The B-type porcelain contains less glass (45-50%) and mullite (37%), and more quartz (10%). Additionally, the experimental data shows that A-type porcelain has the same characteristics, even fired at lower temperature, *i.e.* 1260 °C instead of 1360 °C.