Utilisation of mining waste for the development of added value final products

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Nearly all dunites and hurzburgites in the western Chalkidiki ophiolite complex are serpentinized from 10 to 60%. Dunite/harzburgite formation in Yerakini-Chalkidiki area is the host rock of magnesite ore ($MgCO_3$), which is mined to produce magnesia (MgO) as final product. The waste material produced from the beneficiation process of magnesite is either stock-piled, used for rehabilitation purposes or, to some extend, sold as road substrate. It has been proven that a considerable amount of this waste, as described above, contains significant amounts of olivine that after beneficiation using appropriate methods could provide a material rich in olivine (75-90%) with a low serpentine content (below 10%) and a correspondingly low LOI value (1,5-2,0%). In order to produce material of the aforementioned quality, research was carried out in the framework of a European Project on the efficiency of application of low cost and environmentally friendly processes, such as dense media separation, shaking table and magnetic separation in laboratory scale. The results of the laboratory testing were very encouraging. In particular, the produced material can be used for the production of nano-silica for cement and paper coating applications.

Keywords: mining waste, dunite waste beneficiation, olivine, magnesite deposits