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Characterization and valorization of the waste from the abandoned Kettara mine and the gypsum quarry in Sidi Tijji (Marrakech-Safi Region, Morocco).

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In Morocco, no measures have been taken to manage residual waste from operational or abandoned mining and quarries sites.

Indeed, significant quantities of mine waste, composed of concentrator residues and sterile waste, have been abandoned after the closure of operations without any effective management or rehabilitation planning.

These residues could have harmful impacts on the environment: soil and water pollution, destruction or disturbance of natural habitats, visual impact on the countryside...

The valorization and sustainable management of mining waste appear to be adequate solutions to major environmental problems. The construction sector can be a profitable sector to absorb chemically stable mining waste.

The objective of this research work is to study the feasibility of recycling waste from the abandoned Kettara mine (Morocco) and gypsum waste rock in Sidi Tijji (Morocco) as raw materials in construction materials.

The study consists first of a geological characterization and then a characterization of the physical, chemical and mineralogical properties of the residues, followed by an evaluation of the mechanical properties of the composite mixtures based on the chemically stable residues.

The Kettara mine is located in the Jbilet Central Mountains, 30 km northwest of Marrakech. Geologically, the pyrrhotite district of Kettara corresponds to the outcrop area of the volcano-sedimentary series of Saghlef shales. For the gypsum quarry at Sidi Tijji, which is part of the Safi basin, characterized by Jurassic outcrops essentially formed by gypsum and carbonate formations.

Mineralogical and chemical analysis have shown that these waste products are still rich in minerals such as the waste from the Kettara mine; the FeO3 concentrated amounts to 55.6%. In addition, gypsum waste rock represents a concentration of 28.9% CaO. Therefore, a low water content for the majority of samples.

Adapting to the principles of integrated recovery and management of mining and quarry waste requires a cultural change within the industry, but also in the ministries concerned.

Keywords: Valorization, mine waste, mines and quarries, construction materials.