



RECYCLING OF MINE WASTES AS RAW MATERIALS FOR THE CONSTRUCTION SECTOR: SOLUTIONS BASED ON MATERIALS CIRCULARITY AND SUSTAINABLE RESOURCE GOVERNANCE

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ABSTRACT

The mining industry in general, and the phosphate industry in specific is an important mainstream in terms of waste rocks as it generates huge amounts of waste rocks and tailings during their activities. As a matter of example, the phosphate mining in Morocco produces amounts up to 150 million tons or even more of waste rocks and tailings each year.

Non-polluting mine wastes (Tailings and waste rock) must be regarded as an opportunity to create new value. The reuse of these wastes, depending on their chemical, mineralogical and geotechnical properties, as alternative raw material in construction and building materials field constitutes a promising environmental solution. The main objective of our studies in Morocco was to investigate the feasibility of using non-polluting mine wastes to produce materials especially for the construction sector, such as using phosphate mine wastes as cementing materials, as additives in mortars or concrete, or as raw materials for bricks, ceramics and geopolymers or aggregates for roads construction and B25 concrete. The phosphate waste rock has to be classified in the category of natural aggregates that are similar to conventional materials. Laboratory and pilot scale investigations demonstrated that recycling mine wastes from may be feasible.

The presentation will be focused mainly will be focused mainly on the valorization of phosphate waste rock an alternative aggregate in the construction sector. In addition, Jerada coal mine wastes recycling investigate the use of an integrated and circular approach based on coal recovery and waste rock recycling as alternative clays and aggregates (gravel and sand) in the construction sector. Froth flotation was used to recover coal particles using diesel as a collector and Methyl Isobutyl Carbinol as a frother. The tailings of coal flotation process (CFT) were used to manufacture fired bricks at a pilot scale. Then, gravel and sand obtained after a CMWR screening were tested as alternative materials for concrete production. The choice of the construction sector is based on its capacity to absorb huge quantity of materials.