

MARBLE WASTE: A PROBLEM OR A RESOURCE?

Wisal Shah and Muhammad Nafees

Department of Environmental Sciences, University of Peshawar

shahwisal@yahoo.com

Abstract

In Khyber Pakhtunkhwa Province of Pakistan have rich reservoirs of dimensional stones. In this category, the most important position is occupied by the marble. The users prefer its physical properties due to its colors in different shades and designs. Marble reserves of Khyber Pakhtunkhwa contributing 97% to the country marble deposits. There are more than 1500 marble processing units (MPUs) scattered out in the province generate large quantity of waste in the form of irregular marble stone pieces and marble slurry. Approximately 40-70% of the marble goes to waste during quarrying, processing, and polishing operations. Marble processing waste deteriorates the surface waters and soil quality. The objective of this study was to investigate the mineralogical characteristics of marble processing waste for useful applications. Marble slurry waste samples were collected from marble processing units and analyzed after conning and drying in oven at 110 °C to remove the occluded water. Laboratory results shows (CaO) calcium oxide as the major component (>50%) with loss of ignition around (>40%), this constitute main bulk of CaCO₃ (>90%) and small amounts of SiO₂ (<2%), MgO and Fe₂O₃ (<3%) which show its high compatibility to use in the manufacturing of other secondary useful products. It was recommended that, Filter press should be used in MPUs for separation of water and marble powder from slurry and stores it in a common storage depot. After which it is send to those industrial units where it can utilize in secondary useful product. The sectors identified for recycling of marble waste are cement manufacturing, lime, dish washing powder, bricks, tough tiles and hollow blocks making.