Incorporation of marble sludge in industrial building Eco-blocks or Cement bricks formulation

Fakher J. Aukour

Faculty of Natural Resources and Environment, The Hashemite University, Zarqa-Jordan, Postal Code 13115, P.O.Box 150459, Tel: +962-5-3903333 Etx. 4694, Email: fakagr67@hu.edu.jo.

ABSTRACT

Producing eco- blocks to be used in houses building from marble sludge through maximum possible substitution of sludge for sand and other components of the mixed materials used in block manufacturing was investigated.

Samples of different formulations, in the form of extruded bars, were produced at both laboratory and pilot-plant scales and characterized at the final stage of the production process. 178 formulations were prepared to examine the proper formulation that is fit with the national and the international standards, just five of them were promising, and two were chosen for commentary purposes.

The main objective of this study was to investigate the possibility of marble sludge recycling in the use in useful materials such as house building materials. The other objectives can be summarized in saving natural resources and reducing their used quantity. The experimental results and their theoretical interpretation show that suitable incorporation of marble sludge can result in building blocks of 15 cm with superior properties, in terms of water absorption (7%). The compressive strength at age of 28 days only reached (195.8 KN or 7.8 N/mm²).

Keywords: Eco-construction blocks, marble sludge, natural resources, sustainability, environment, waste re-use.

Introduction

Marble cutting industry produces large amounts of solid wastes on large areas, which are expected to increase as construction is continuously increased, owing to the fact that the world