Construction and Demolition Waste (CDW) Recycling

Introduction

Building industry ➤ Nation's socioeconomic development

Negative environmental effects
- High-energy use
- CO2 emission
- Large quantities of non-biodegradable CDWs piled up in landfills

Methodology

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Waste management
21st century’s most difficult concerns
(Generated at the end of a structure’s service life, reconstruction, alteration, extension, maintenance, and demolition of buildings and other infrastructure)
One of the major waste categories & Heaviest

CDW

First Step
A manual separation of the 0.5–4 mm fraction

Second Step
XRD and XRF analysis to determine the chemical and mineralogical composition of the wastes.
Then optical microscopy and scanning electron microscopy to complete the characterization and determine the morphological and mineral liberation characteristic of particles

References


CDW

- Coarse Particle
- Fine Particle
- Majority of effective recycling facilities for sorting and recycling
- NOT effective on sorting & recycling fine particles
- Despite Comparable Materials
- Although account for 30% of the CDW & Can be recycled
- Frequently landfilled

- Moisture & organic matter (OM) in fine particles
- An aerobic conditions
- High gypsum concentration in fine particles
- Impermeable layers in landfill facilities
- CH4 & H2S
- High costs
- Rejected by landfill operators
- Recycling
- Cut energy usage
- Reduce CO2 emissions
- Lessen illegal dumping & sand mining

- First Step
- A manual separation of the 0.5–4 mm fraction
- Second Step
- XRD and XRF analysis to determine the chemical and mineralogical composition of the wastes.
- Then optical microscopy and scanning electron microscopy to complete the characterization and determine the morphological and mineral liberation characteristic of particles
- Final Step
- Gravity separators to separate aggregates, concrete paste, gypsum, brick and mortar.
- At the end, after liberation of the CDW’s sands, new materials can be produced and the composition of it is confirmed

CDW

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