Municipal Solid Waste Management in Muscat: Classification, Uses and Potential Problems

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Abstract

Solid wastes are all the wastes generated from different daily activities that are normally solid and are discarded as useless or unwanted materials. The aims of this research study are characterization of municipal solid waste in Muscat, characterization of fine particles with size less than 20 mm from Al-Mulatqe landfill; study the public awareness through social survey; and recommend the utilization practices to minimize solid waste.

The characterization was conducted for moisture content, volatile content, loss in ignition, oxides, and leachate analysis. The moisture content, volatile content, and loss in ignition were found using approximate analysis. Total oxides content of Aluminum (Al), Calcium (Ca), Magnesium (Mg), and Iron (Fe) were determine using Flame Atomic Absorption Spectrometer. In addition, different analyses were done to check the leachate characterization such as bacteriological analysis, solids, biochemical oxygen demand (BOD), chemical oxygen demand (COD), and total organic carbon (TOC).

The average values of moisture and volatile content were found 30% in February 2013. Loss in ignition contents varied from 12% to 23% in both April 2013 and May 2013. Total oxides reached 100% and 90% in April 2013 and May 2013, respectively.

The social survey study showed positive responses from the public towards solid waste management. However, education and awareness regarding solid waste handling, management and treatment were found essential for the successful implementation of solid waste management plan. Finally, it is recommended to upgrade the entire system of solid waste management from the legislations to the final disposal mechanisms. As a result, the consideration of solid waste as a valuable resource rather than a problem to be disposed, can be achieved.