



Gravimetric characterization of inorganic wastes confined in lysimeters

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Abstract

A large portion of MSW (Municipal Solid Waste) in the city of Campinas is made up of recyclable material, however, the recovery rate of recyclables in relation to the amount of MSW collected is only 1.29%. The objective of this research was to characterize inorganic MSW confined in two lysimeters built at Unicamp, aged 4 years, in order to quantify and characterize recyclable materials. A characterization of the gravimetric composition in 14 categories was performed, totalizing 4.256 kg of wastes. As an important result, about 65% of the MSW corresponded to materials with recyclable potential.

Key words: Municipal Solid Waste, Gravimetric Composition, Recyclable.

Introduction

According to the National Solid Waste Politic (BRASIL, 2010), municipal solid waste (MSW) is defined as household solid waste and urban cleaning waste. According to the National System on Sanitation Information (SNIS, 2014), 98.2% of the population of Campinas has data collection services, generating 1.08 kg/hab.day. The recovery rate of recyclables in relation to the amount of MSW collected is 1.29%. Large share of MSW consists of recyclable material, such as paper, cardboard, plastic, aluminum, among others. Lysimeters are considered models of waste landfills at laboratory scale, and thus constitute a small-scale experimental MSW landfill (BARLAZ et al., 1989; MONTEIRO, 2003; MORETTO, 2018). In 2014, 6 lysimeters were built in a research area of the School of Civil Engineering and Architecture and Urban Design (FEC) of UNICAMP, simulating the conditions of Delta A Municipal Sanitary Landfill, Campinas - SP. Therefore, the objective of this research was to characterize MSW confined in 2 lysimeters built at UNICAMP, aged 4 years, in order to quantify and characterize recyclable materials. A characterization of the inorganic gravimetric composition in 14 categories was performed, totalizing 4.256 kg of wastes. The organic fraction was removed from the sample for study in complementary research.

Results and Discussion

The gravimetric characterization of the inorganic waste is presented in Figure 1. The soft plastic fraction, consisting of plastics malleable, as plastic bags, was the most representative in the 2 lysimeters, with 43.78% of total waste. Among other recyclable materials, quantities of paper (7.79%) were observed, metal (5.39%), long life packaging (4.82%), hard plastic (non-flexible) (2.69%) and cardboard (0.21%). In Brazil, recycling began to develop in the decade of 1970, mainly due to the unmeasured use of natural resources by the Industries and the excessive accumulation of waste in local that have caused serious impacts to the environment. In this period, new tools and techniques emerged to enable the reuse of waste. In the end of the 1980, with the introduction of the ethylene polyterephthalate bottles in the Brazilian industry, there was a great concern about the increase in amount of discarded residue, a factor that boosted the beginning of plastic recycling (LOMASSO et al., 2015). However, it is noted, of the gravimetric composition, by the quantity of recyclable materials

confined, the partial efficiency of selective collection in the municipality of Campinas, disposing on sanitary landfills, possible recyclable materials with commercial value.

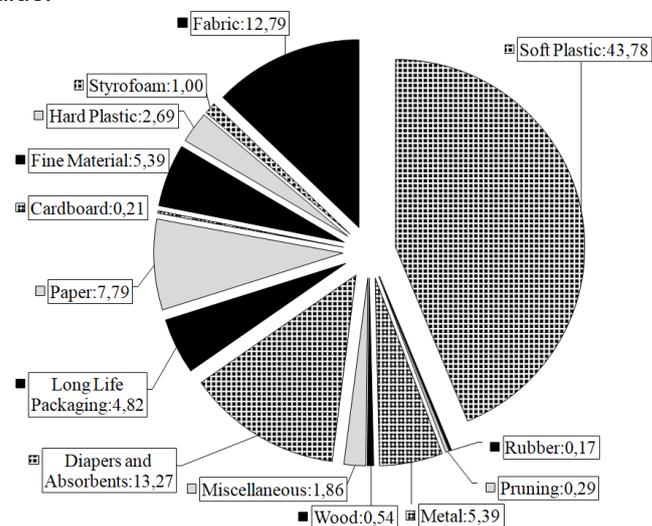


Figure 1. Gravimetric composition (in percentage).

Conclusions

Although there is a great concern in the Brazilian industry with the increase in the amount of discarded waste, it is also noted the partial efficiency of selective collection in Campinas, discarding approximately 65% of materials potentially recyclables in sanitary landfill sites.

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