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Waste characterization at mixed municipal solid waste composting and recycling facility units

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ABSTRACT

The waste characterization for the Istanbul Metropolitan Municipality Composting and Recycling Facility, which is one of the four composting facilities in Turkey, has been investigated in this study. Main units of the facility include Waste Receiving, Ø80 mm Trommel Screen, Hand Sorting Unit, Composting Unit and Ø15 mm Trommel Screen. The changes of waste profile in the units of the facility and its effects on the compost product were determined by monthly for one year period. In addition, the inert content (glass, plastic, metal and textile) of the compost product, which is important for marketing, was determined and certain strategies were proposed for the reduction of these materials. Food waste (49.5%) was the biggest percentage in the incoming mixed municipal solid waste. The other main constituents were paper-cardboard (16.4%), plastic bag (8.3%), diaper (5.1%), textile (4.6%), glass (3.5%), and plastic (2.7%). The maximum percentage of the components for the Ø80 mm undersize material, which goes into composting process, were food waste (73.9%), paper-cardboard (9.6%), textile (3.9%), and glass (4.2%). In comparison to the incoming waste, a significant increase was determined in the food waste (from 49.5% to 73.9%) and glass (from 3.5% to 4.2%) for the Ø80 mm undersize material. In contrast, the percentage of the paper-cardboard, plastic bag, and diaper remarkably declined for the Ø80 mm undersize material. The inert content of compost product was approximately 5.6% (glass: 4.2%, textile: 0.8%, plastic: 0.6%, and metal: 0.1%). It is determined that if the additional screening is applied to the fine compost through Ø4 mm trommel screen, the inert content could be decreased to 1.02% which meets the criteria of less than 2% inert content set by the related regulation in Turkey.

Keywords: Composting; Glass; Inert matter; Waste characterization

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